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AMERICAN ALPINE JOURNAL

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THE
AMERICAN ALPINE JOURNAL

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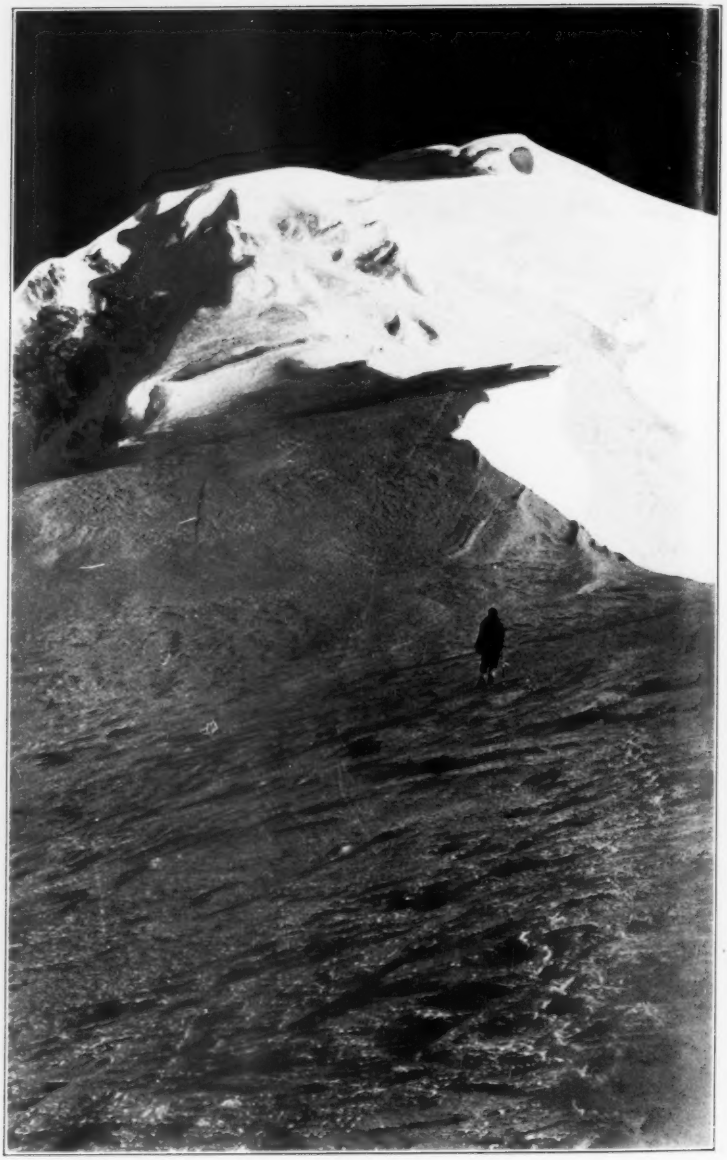

Photo A. Carpé

CENTRAL PYRAMID OF MT. FAIRWEATHER FROM ARÊTE LEADING TO SOUTHEAST SHOULDER

The steep ice slope leads up dome at left center. Ice bluffs of summit cap which blocked party in storm are visible

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The Fairweather Climb

WILLIAM S. LADD

THE story of the expedition which made the first ascent of Mt. Fairweather in the spring of 1931 has been ably told by others of our party.[1] It is not the intention to here repeat the story, but instead to give some of the details of the climb from the camp at 5,000 feet on the Fairweather Glacier almost to the summit.

It was Sunday, May 24th, a perfectly glorious day, when we made camp at that level. It was pitched on a table of snow between two great crevasses, each well over a hundred yards long, twenty feet wide in the middle, with sheer sides and the depths in darkness. We were about a third of a mile from a great snow-and-ice fan formed by avalanche material from the ridge up which we intended to proceed. This ridge was broad, several hundred yards wide at the base, edged on the west by a great series of cliffs, rising buttress upon buttress from a hundred feet above camp to an altitude of about 11,000 feet or more. On top of the broad ridge there was a heavy accumulation of snow and ice, well glaciated and in certain areas forming ice-falls of considerable size. These ice-falls were impassable. Beside them rose irregular bands of rock which had to be crossed in the ascent. On

[1] "The Conquest of Mt. Fairweather," by Allen Carpe, *A. J.*, November, 1931, Vol. xliii, p. 221.

"The Climb of Mt. Fairweather," by Allen Carpe, *The Mountaineer*, December, 1931, Vol. xxiv, p. 7.

"The Ascent of Mt. Fairweather," by Allen Carpe, *Harvard Mountaineering*, 1931-2, p. 5.

"Mt. Fairweather is Conquered at Last," by Terris Moore, *The Sportsman*, October, 1931, Vol. x, p. 48.

account of the width of the ridge, the climbing was that of a mountain face rather than of an arête, and we did not reach a narrow arête until we had attained an elevation of about 11,500 feet.

The night of the 23rd had been cool, and if the night to come were cold and crisp, the 25th should be an ideal day for a climb, for on this day, the 24th, the slopes were rapidly shedding snow and ice. Every few moments the roar and rumble of snow-and-ice slides and avalanches were heard. Several came down the couloir above the snow-fan which gave the only practical access to the ridge I have just described. Although we all were tired from five days of forced packing to reach our present station, we decided to press on immediately, early the next morning. We rose at 12.30 A.M. the morning of the 25th. The thermometer stood at twenty degrees, which augured well for hard slopes, but it was 3.40 A.M. before we had taken down one tent, made up our packs, and left the camp in order for two or three days' absence.

Our packs, when made up, weighed 35 to 40 pounds apiece. They contained food for two or three days, tent, sleeping bags, two air mattresses, one gasoline Primus stove, a gallon of gas, two 120-foot lengths of rope, cameras, and some extra clothing.[2]

The going was excellent, as there was a good hard crust and it took but a few moments to reach the snow-fan and start upward. Here the way became somewhat rough over the frozen avalanche material. We carried two aneroids by which we checked our progress in altitude. At the end of the first hour we had only ascended 650 feet, but we were well in the couloir. The going became very steep in the upper half, the slope being about fifty degrees (clinometer) toward the head of it. Step-cutting had to be done in places and a sharp lookout kept for possible avalanche material coming our way. For several hundred feet we edged along close to some rocks, into the irregularities of which we could dodge in case of ice falls. At 5.40 A.M. we had climbed 1,100 feet and came out on a small snow saddle leading from the slope to a rocky buttress. Here we rested fifteen minutes. We then proceeded directly up a snow slope at first easy, then stiffer, to the base of the first band of rocks. By means of a snow tongue we were able to get on to the rocks where a small buttress pro-

[2] See note on the food list at the end of this paper.

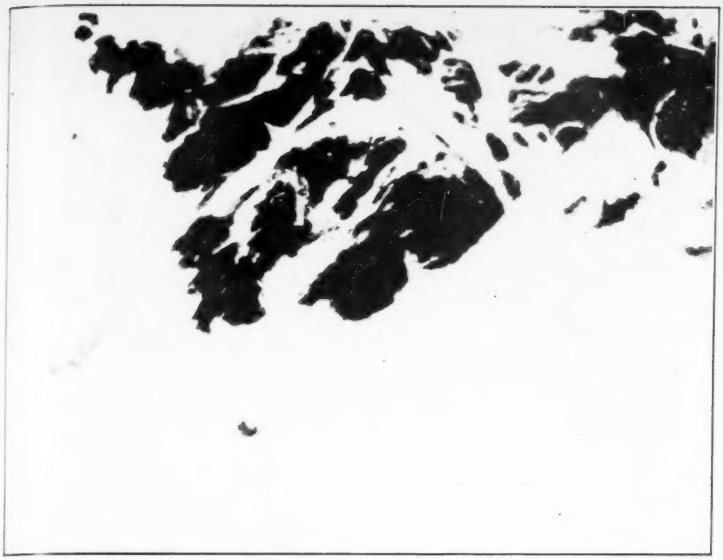


Photo W. S. Ladd

CAMP AT 5,000 FT.

Snow fan and couloir climbed on ascent lies to right of bluffs in center. Camera level

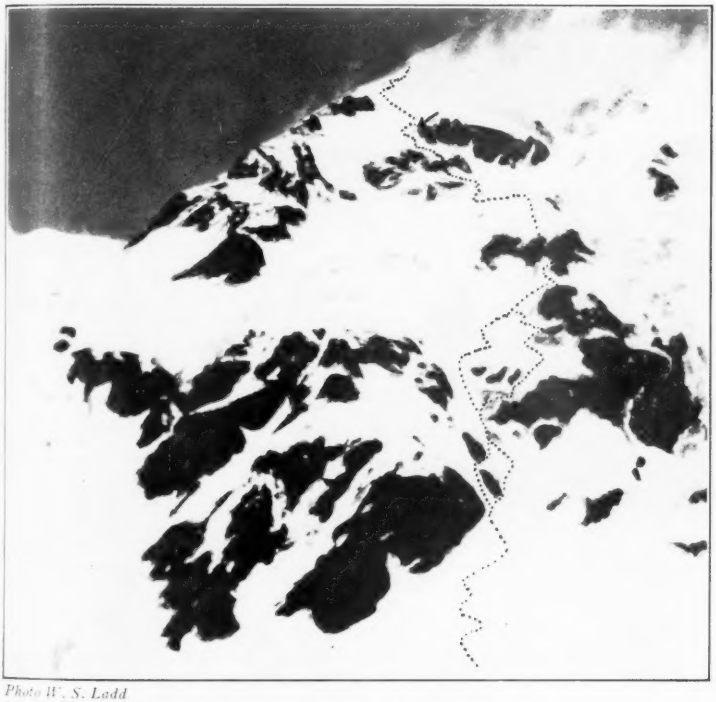


Photo W. S. Ladd

RIDGE SHOWING FIRST 6,000 FT. OF CLIMB

Arrow marks site of 9,000 ft. camp. Top of ridge shown, elevation about 11,500 ft. Camera tilted

Summit

Photo T. Moore

ARÊTE ASCENDED SHOWING MOST OF THE ROUTE

truded at their base. These rocks were not difficult, but we found them covered with a heavy coating of *verglas,* and this in turn covered by two or three inches of fresh snow. We made considerable use of the rope and were forced to climb without our packs, hauling them up with ropes. Conditions were very treacherous.

It was 7.20 A.M. when we reached the top of the first band of rocks, an altitude of 1,500 feet above camp. We proceeded upward immediately with long hauls over snow and ice, passing below a small sérac or two, up a short distance, where step-cutting had to be resorted to; then came easier slopes to the base of the second band of rocks which we reached at 8.30 o'clock. We rested half an hour before we began to ascend the second band of rocks, about 300 feet in height. These rocks in themselves were more difficult than the first band, and the problem of the route was of greater interest. The warmth of the sun had begun to melt the icy coating and many rocks were loose. Again, we proceeded with ropes and had to haul the packs after us. It was slow and tedious work and took great care. We did not reach the summit of the second band of rocks until 11.00 A.M. We were then 3,000 feet above camp.

On continuing, we found the snow slopes getting soft. At 12.45 we had done 1,000 feet more and found ourselves at an altitude of a little more than 9,000 feet, or about 4,000 feet above our camp on the glacier below. The snow had now become so soft that we were breaking through the upper crust and sinking in nine or ten inches. The climbing had become exceedingly tedious.

A small snow saddle reaching from the slope out to another buttress presented itself and seemed to offer a safe place to pitch a tent. To the west of us was the steep snow slope of the face of the ridge, to the east of us cliffs leading down about 500 feet to a glacier basin. Our camping place was protected fairly well by the head of a small funnel-shaped depression just above the snow saddle, so that avalanching snow and ice from above would be deflected over the cliffs to the east. Above us was a long, very steep snow-and-ice slope. We felt that we had proceeded as far as we could without considerable danger, because of the condition of this slope, so we made camp.

We had already noticed small cloud caps forming on the peaks to the southeast, and now as we finished making camp the fog

enveloped us. Soon it began to snow very gently and continued to do so all the afternoon and evening, without wind. We intended to proceed the next morning. We rested and slept fitfully during the afternoon. About 11.00 P.M. when we looked out, it was still snowing. Three inches of fresh snow had fallen. We made weather observations every hour, but the hours passed without a let up. We finally made breakfast at 2.30 A.M. The weather looked rather bad, as if it were settling for another storm, and we debated at length whether to try to go on. The night had not been as cold as the preceding one, and because of the fresh snow and forbidding appearance of the clouds, we decided to go down to our 5,000-foot camp.

Leaving all food and equipment except bedding rolls, we started down about 3.00 A.M., with the snow still gently falling. The rock bands gave us considerable trouble on account of the fresh snow and we left one of the ropes in place on the upper band to help us with the next attempt at ascent. In spite of the trouble on the rock bands we descended to camp in a little over three hours.

As there was no wind and some brightness in the sky, we crossed the glacier to the top of the second ice-fall to bring up more supplies from our cache there. When we got to our cache at the head of the ice-fall, we found that marmots had come from some mountain den in the rocks of nearby cliffs and had eaten all of the butter (about five pounds) that we had left there. Taylor remarked that the marmots would be talking about that find for some time.

The weather turned comparatively warm (twenty-eight degrees) and it snowed occasionally. The surface of the glacier was soft and the slopes above us were avalanching. About 9.45 the sun broke through on us and we had a chance to dry out our beds and clothing, and do some washing. Moore started off on skis across the Fairweather névé to take pictures, but by a little after noon heavy dark clouds rolled in and there was evidence of a good deal of wind higher up. Avalanches had begun coming down soon after we got off the mountain.

That night it got down to twenty-two degrees; the next night it rained, snowed, and blew continuously. About 5 A.M. it blew so hard that the tent seemed in danger of going to pieces. We had placed the skis inside it to keep the sides from bellying and

to shed more of the wind. Four of us in one tent seven by eight feet made it rather crowded, and we had to place our cooking utensils outside. To our dismay on getting breakfast ready we found that our dish pan, wash basin, and plates had blown away. Other things were missing. In a hasty search we were able to find some of them scattered over the surface of the glacier. We traced the course the pans had taken by the wavy tracks they had made as they rolled along in the wind, and after some exciting rescue work—letting Moore down into one of the great crevasses —we recovered a wash basin and the plates. They had, fortunately, lodged precariously on ledges of snow and had not gone to the bottom.

For protection from the gale and storm we dug a pit four feet deep in the surface of the glacier and set the tent in it with our supplies and pack boards. The storm continued in squalls of snow, rain, sleet, and again snow, until about 4.00 P.M. on May 31st.

These days and nights, five of them, were tedious, but amusing. We sat on a couch made of air mattresses most of the day. We read Shakespeare, and a couple of *Saturday Evening Posts*. Taylor and I played cribbage and smoked. When we turned in, the four of us were shoulder to shoulder across the tent, and when one turned over, the others would know it. There was conversation of all sorts and some bets on the weather. There was mending and cooking to be done and snow to be melted for water. We did a neat job splicing the broken crampons with leather strapping and copper wire, so that they served us well.

The weather changed decidedly the afternoon of the 31st and Taylor and I went out to break a trail with snow-shoes across the one-third of a mile to the snow-fan, and partly up it. The wind had quieted. There had been a great deal of avalanching. We found that on snow-shoes we sank almost a foot in the soft snow and we had great difficulty in making our way through and around the crevasses hidden by the fresh snow. We intended to start again to the 9,000-foot camp early the next morning, but our experience in getting to the snow-fan and working up it made us realize that the slopes were in no condition for a climb, and that it would be foolhardy to try the ascent without a day of hot sun and a cold night or two.

The night of the 31st the temperature reached thirteen degrees. June 1st was a beautiful day. There were some tremendous avalanches, both off of the slope up which we intended to climb and the mountains about us. It was very annoying to have to wait twenty-four hours and let a precious day of good weather go by. It had taken much patience to sit in our tent for days after having established a camp at 9,000 feet. The night of June 1 the temperature dropped to eight degrees. We made breakfast at 11.30 P.M. and were away from camp at 1.50 A.M. June 2nd. The snow crust was not good and we broke through a great deal. We carried our sleeping bags and enough food to last us at 9,000 feet for three days, in addition to the food we had left there. In spite of the fact that the going was not so good, we made much better time. The rock bands did not give us quite as much trouble because we had a route worked out, and the rope left in place on the upper rocks helped us considerably with that band.

We reached our upper camp at 7.10 A.M. The weather was perfect. We found the tent snowed in and covered with a foot and a half of snow. Although we had taken it down and placed rocks upon it the wind had ripped it, and it took us an hour and a half to uncover it, let it thaw, and get things in order. While we were doing this a most marvelous and tremendous avalanche of powdery snow came down the glacier, passing to the east from the heights above. Roaring and thundering at first, it quickly became a great, noiseless avalanche of billowing clouds of powdered snow. We turned in at 11.30 A.M.; had a small lunch at 5.00 P.M. and at 11.30 P.M. cooked a breakfast and prepared for the final stage of our climb. Although it does not become really dark at any time at this latitude and season, we found the light too deceptive to proceed up the slopes immediately. It was at 1.00 A.M. June 3rd when we got under way.

The slope above camp was steep, the crust poor and we broke through easily. We went unroped. The quality of the snow varied and we found that at times the best progress was made by going on all fours, driving in the blade of the ice-axe and digging in the toe prongs of our crampons. In an hour and twenty minutes we had done 800 feet, and another hour 700 feet more. Then came a sheer ice wall, so very steep that it was necessary to cut large and deep steps. We roped. Here the wind

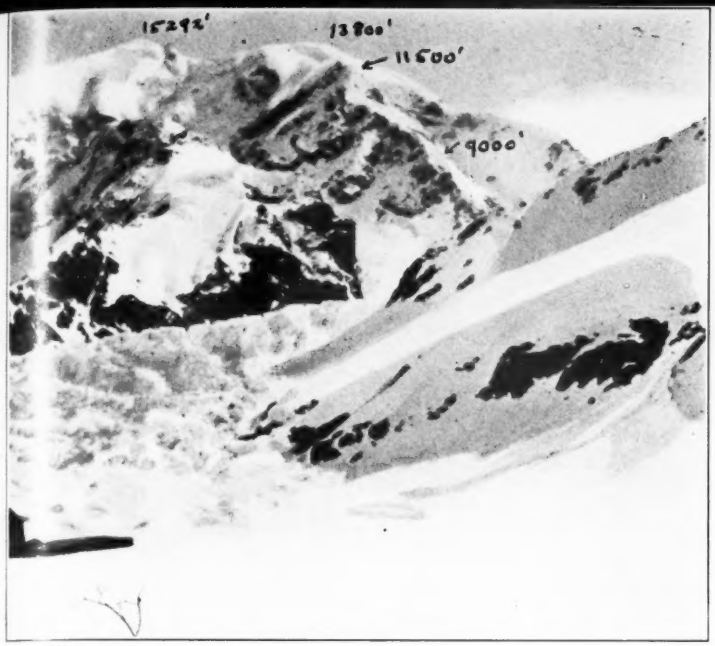


Photo W. S. Ladd

VIEW FROM CAMP AT 3,500 FT. SHOWING UPPER ICE-FALL OF GLACIER WITH MOUNTAIN BEYOND

Photo W. S. Ladd

CAMP AT 2,500 FT. ON FAIRWEATHER GLACIER, BELOW LOWER ICE-FALL

Photo W. S. Ladd

CAMP AT 9,000 FT.

Photo W. S. Ladd

SUNRISE ON THE SECOND GABLE

Southeast shoulder in shadow in upper left corner

hit us. The temperature at the start had been about eighteen degrees, but it rapidly grew colder. After surmounting this ice wall we had easy going for a few hundred feet, on wind-packed snow, then came looser snow and one or two troublesome crevasses. Like small schrunds they were, and getting over the upper lip gave us some trouble. The character of the going was consistently varied, sometimes a hard surface and easy, with a crust swept bare of snow; sometimes firm, wind-packed snow; and sometimes soft, dry, powdery snow. We now had about 500 feet of very steep slope. We were afraid that the wind-packed snow might slip on the crust below. We proceeded slowly, digging through the surface snow, cutting steps in the ice crust beneath.

By 6.10 A.M. we had reached the summit of this slope, about 2,000 feet above our camp. From below, this place had appeared as a small peak but in reality it was the termination or beginning of a long arête, the point of the broad ridge we had ascended with a long narrow arête leading eastward to the slopes below the southeast shoulder. The temperature was now ten degrees. We rested and ate a little, then went on. For two or three hundred feet the arête was steep and icy, with occasional outcrops of rock which afforded good holds and gave us a sense of security. The arête then became a fine, narrow snow ridge with a small cornice to our left, and a very steep drop on either side. The snow on the top of the arête was dry and powdery and windpacked.

Here the sun struck us and the temperature rose to twelve degrees. We made fair progress. At one place, halfway toward the shoulder, the arête was broken by a very steep slope about seventy feet in length. It was as though we had been traveling along the gable of a house and came to the point where it blended with the slope of a roof which led to another gable at a different angle above. This slope, though short, was precarious and took great care in the making of steps. A slip here would have shunted us off to one side or the other of the gable we had just left. It took time out of all proportion to the length of this slope to reach the arête at the top.

As we had come up, the moon had passed out from behind Mt. Lituya to the south. Just before it appeared a golden glow came from behind the peak which amazed us. We wondered what the phenomenon could be. Then the moon passed serenely

across the space between Lituya and set behind the peak to the west. It gave one a very queer sensation. Dawn was beautiful, with cold whites and greens changing to yellows and rose as the sun came up. We had had a fine Aurora Borealis during the night.

The last half of our snow arête gave us no trouble, and led us to moderate slopes of rough snow and old, honey-combed icy surface which made easy going to the summit of the southeast shoulder. Here we arrived at 9.20 A.M. It had been blowing a gale all the way and we all were frosted about the face and hair and edges of our caps.

On the shoulder we stopped to take some photographs. The views were magnificent. We noted a thin, high canopy of cirrus clouds forming away to the east, and apparently moving toward the Fairweather Range, but the wind where we were was a strong west wind. There was a great brilliant sun-dog about the sun. There were no caps on the mountains, however, and we did not even consider the possibility of early bad weather. The surface snow of the shoulder summit presented most interesting patterns of sastrugi. There was no protection from the wind, so we dug holes in the snow and sat in them to eat a breakfast of cold, hard sardines, hard tack and chocolate. We had no water or other liquid, but we were not troubled by thirst. The temperature was five degrees.

After a half-hour rest we started across toward the central pyramid of the mountain. This was a broad arête exposed to the hard wind with some tremendous cornices to the east. It was easy going for about three-quarters of a mile, but as we approached the central pyramid, became steadily steeper.

While at breakfast Moore and I had carefully examined the central pyramid with the glasses, and worked out what we thought was a very satisfactory route to the summit. Once across the arête and a little way up the slope, we came to a schrund which was not troublesome. Above this, the slope of the pyramid presented at first a very steep ice wall about 150 feet in height. It was on the southeastern face of the slope of the central pyramid above the head of our arête. Here we knew we would have to do step-cutting. Once surmounted, it looked as though there would be no difficulty in proceeding up more moderate slopes to within about 300 feet of the summit. Here there was another

area of crevasses, and above them ice walls which guarded the summit cap. It was as though the central peak were a large rocky eminence with steep sides heavily covered by snow, which, in settling and breaking away, had formed crevasses of a schrund-like character, the upper lips of which formed snow or ice cliffs thirty or forty feet high, but no rock was exposed. We were able with the glasses to work out a route through these ice bluffs by bearing to the east, reaching the slope from the summit to the east of it. We felt that we could then turn abruptly to the west and easily surmount the summit itself.

We reached the base of the central pyramid at 11.30 A.M. We roped up, and Moore led, cutting steps. Again, very great care was necessary in proceeding, for it would not have been easy to hold anyone who slipped. Steps were made deep, one man moved at a time; careful attention was given to the rope and to anchoring our ice-axes. All went well, and we did not notice the increasing cloudiness. The wind continued, whipped loose surface snow across our slope and the chips of ice blew in our faces. It was very cold.

About 12.30 we finished the step-cutting and arrived on a slope above, so easy that we took off the rope, but, to our consternation, we found that we were enshrouded in cloud and that it was snowing. The visibility was not good. All had seemed so fair while we were crossing the arête below that we had left our willow twigs, which, up to this point, we had used to mark our route. How we regretted this now! It was snowing so fast that, with the wind, our tracks were quickly obliterated. We took compass bearings and proceeded, following what we thought to be the course we had mapped out. In twenty minutes we found ourselves in the mass of crevasses which I have described, just below the summit, and we were faced by insurmountable snow and ice walls. By now the visibility had become so bad that it was difficult to tell, in making a step, whether we were stepping up or down, and we had to sound each step.

One after another of us took the lead, and tried to find the way through, each time to be halted by a crevasse too wide to cross, or an unscalable ice wall. We knew that we were just beneath the summit cap and not more than 250 or 300 feet below the summit. It was tantalizing business, this working back and forth unable to see ahead more than a few feet. After an hour

and a quarter of this futile seeking, it seemed unwise to continue. The storm was steadily increasing in violence, and we knew that to descend the ice slope below would be extremely difficult, if we could find it at all. The temperature was two degrees.

Two of us had carried in our pockets extra pairs of black felt insoles. These we had cut into narrow strips and planted in the snow as we came along up from the ice slope where we had cut steps. We had left four inches of the felt protruding from the surface. With the aid of our compass bearings and these markers we succeeded in finding our way back to the steps. There was little sign of them, and each step had to be cleared as we proceeded downward. It took us over two hours to descend this short distance. The conditions were the worst I have ever experienced on such a slope. Once down to the arête leading over to the northeast shoulder the storm was less violent and we made good time across. We proceeded on down and about 500 feet below the shoulder got beneath the storm, and could see occasionally through cloud rifts some of the country below us. Once a patch of sunshine on the glacier below made us hesitate and debate the possibility of sitting out the storm in caves dug in the snow, but our experience with the previous spells of bad weather convinced us that we ought to return to the 9,000-foot camp.

Good time was made and the steep slopes below were in better condition than we expected. Apparently the sunshine in the morning had done a little melting, and the cold of the storm had solidified the surface so that conditions were safer than they had been on the ascent. Nevertheless, in a number of places we had to face the slope and go down backwards. As we descended, the storm seemed to descend with us and it snowed a little all the way down. We reached camp about 7.30 P.M.

We cooked a good supper, took stock of our provisions, and debated what to do. There were occasional fitful gusts of wind. We found the barometers had dropped, but we turned in with the determination to try again the next morning if the weather permitted. During the night we looked out every hour or so. Conditions did not change much, but it was clear that we could not climb the next morning. About 3.30 A.M. June 4th we made a breakfast and all turned out to look things over. It was apparent that we were in for another storm.

There were several possibilities. We had food to last the four of us four days more, at most. It was a question whether the gasoline would hold out that long. All water had to be made by melting snow. We could all stay and take a chance that the storm would break, or we could all go down once more and risk the delay of waiting through a day of good weather to make the lower slopes safe and climbable as we had done before. If we could start from 9,000 feet the moment the weather cleared, it would be an advantage, for it would not be necessary to wait for a day of sun and then a cold night. Conditions were so constantly cold on the upper slope that climbing was possible even with a fresh fall of snow, as the wind packed it well and the sun had little effect upon it.

Again we debated at length. It seemed to Taylor and me that the surest way of securing a complete ascent was for two of us to stay at the 9,000-foot camp, and the other two to descend to the 5,000-foot camp, waiting there either to ascend and join the others or to help them if necessary. Consequently Taylor and I regretfully left the others. The descent was the most difficult bit of mountain work we had done, as conditions were very bad. With the new snow, which was at times a little wet, the rocks were difficult, so all the way we had to proceed with great care. We left one rope with the others, and descended to the upper band of rocks unroped. Then we took the rope we had left there with us, using it all the way. We did not reach the 5,000-foot camp until late in the morning.

It was storming, with wet snow and rain. We were kept to the tent, with two days of constant storm. We then determined to move some of our material, which we wished to save, down the glacier. The storm had let up where we were, and there were signs of clearing, but for those in the camp above it continued with considerable violence. They told us later that at times they had to take down the tent pole and hold the tent over them, as they lay in their sleeping bags, to keep it from ripping and blowing away.

Our food at the 5,000-foot camp was now low. On the 6th Taylor and I had moved some of the material down the glacier. We now decided it was better to move to the cache further down so that there would be food for Carpé and Moore when they came down to the 5,000-foot camp.

On the evening of June 7th about 9.00 P.M. it began to clear. Carpé and Moore made a breakfast and were off by 10.00 P.M. for another try at the summit. They found going up the steep slopes tedious, with soft snow in places. On the icy slopes, however, the snow had blown off. Most of the steps cut five days before were in good condition, except for being filled with dry, wind-packed snow. They climbed constantly. There were large cornices on the snow arête approaching the northeast shoulder of which they had to be wary. These were on the opposite side from the small cornices we had found before. The willow wands were still in place. On arriving at the northeast shoulder they paused for a short rest only, as it was extremely cold—well below zero.

The surface of the northeast shoulder and the long arête across to the summit pyramid were greatly changed. There were tremendous cornices on this arête, which seemed somewhat narrower. Once or twice sections of cornices broke and made the situation precarious. It was a difficult proposition this time, where before it had given no trouble. At the steep ice slope near the base of the summit pyramid they found our old steps, which were still serviceable, though they needed some modification. Above this slope they continued to the left of the route we had taken, and avoided the crevassed area by ascending a rather steep slope on the southwestern aspect of the summit cap.

They arrived at the summit at 8.00 A.M., having taken ten hours for the ascent. The weather was beautifully clear and several splendid photographs were obtained. They had carried up with them a tent pole and a light tarpaulin, intending to sit out in snow caves any storm that came along. I had given Moore my extra light parka. They tied this to the tent pole and left it planted on the western edge of the summit platform. This was seen three days later from near the beach.

Meanwhile Taylor and I had seen through the glasses that they had taken the tent down, and since the weather was not in the least threatening, we continued to pack our materials down to our last firewood camp about twelve miles from the sea. We kept a sharp lookout with the glasses, and knew when the camp at 9,000 feet disappeared that they had come down.

It was now over two months since we had left Juneau. A boat was to come for us if no word was heard from us by

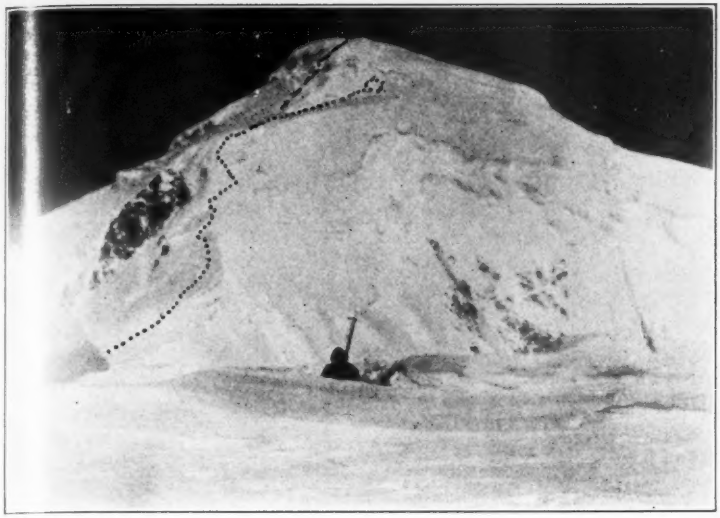


Photo W. S. Ladd

FINAL PEAK OF MT. FAIRWEATHER FROM SOUTHEAST SHOULDER

Dots show route on June 3rd. Dashes indicate route of Carpé and Moore to summit

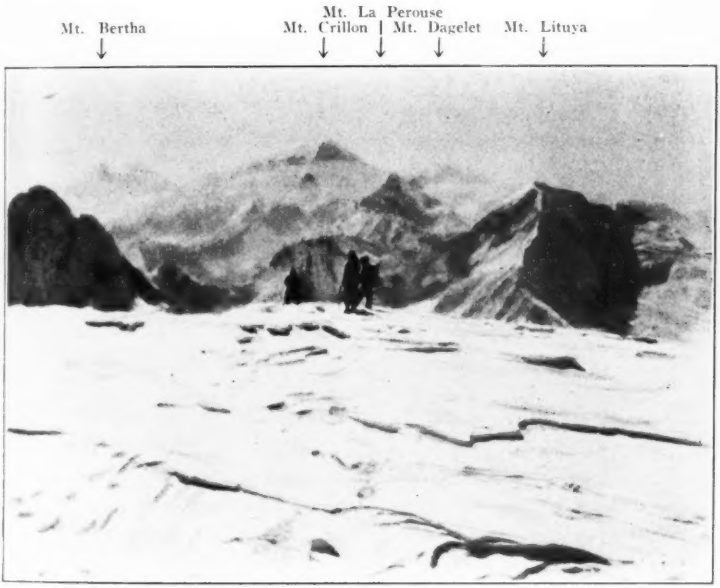


Photo W. S. Ladd

LOOKING SOUTH FROM SOUTHEAST SHOULDER

Photo W. S. Ladd

FAIRWEATHER RANGE FROM LITUYA BAY

Southeast shoulder and ridge of approach outlined by sunshine and shadow

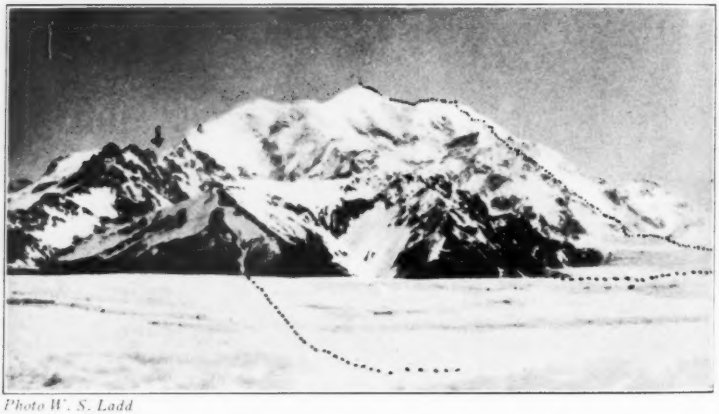


Photo W. S. Ladd

SOUTHWEST FACE FROM LOWER FAIRWEATHER GLACIER

Arrow shows notch in northwest arête which stopped party in 1926. Dotted line indicates route of 1931

June 10th. We therefore started toward Lituya Bay, where we arrived on the 11th. Moore and Carpé caught up with us, arriving at Lituya Bay two or three hours later.

NOTES ON ALASKAN CLIMBING

Weather

The weather experienced in the Fairweather Range is most uncertain. Great banks of fog continually drift in toward the coast from the ocean. These move up the glaciers, often making glacier travel difficult unless markers are used. The Alaskan trick of using willow markers is an excellent one. Willow wands about two and one-half feet long are cut and tied in bundles of a hundred, and planted in the snow every fifty yards. They seem to withstand any sort of wind, and remain in position well. If the surface is ice or rock, three wands are tied together at their tips and set up as a tripod. This tripod remains in place, even in very strong winds. These markers are a great help to one when the visibility is bad.

We had clear weather only with a northwest or northeast wind. At such times barometric pressure would be high and constant. At other times the barometer was lower, though not so variable. There are probably clear weather and good conditions for climbing at times when the coast is enshrouded in fog and rain, but one must plan the food supply so that at any time during a climb he may be able to reach food and shelter and hole up for a week at a time.

Climbing Conditions

Climbing conditions are very variable and, of course, depend much on the weather. They do not seem to differ greatly from those found in such areas as the Canadian Rockies or the Alps, except at high altitudes, where there seems rarely to be any considerable melting. Icy slopes and icy conditions seem to be due more to pressure changes that take place in snow which has lain long.

From an altitude of 2,500 feet on the glacier we had to travel at night. We usually started out about two in the morning, and went forward to make a cache, returning to camp by nine or ten

in the morning. There was a great deal of snow on the surface of the glacier which had fallen in the month previous, and many of the crevasses were still closed. Going was comparatively safe during the early hours of the morning, but as the day warmed crevasses were visibly opening, and one had to proceed with great caution. By two in the afternoon, the snow usually softened to such a degree that it was difficult going even with snow-shoes, unless a trail had been broken. This occurred whether the day was bright or cloudy.

In passing the ice-falls the snow slopes at the sides of the glacier had to be avoided from nine in the morning until late evening, because of the numerous snow slides and avalanches. On cold nights the avalanches ceased about nine o'clock. The coldest time of night was usually around three in the morning.

Equipment

Mt. Fairweather was essentially a snow climb, as were Mts. Logan, Bona and McKinley. Various sorts of clothing were worn but wind-proof and water-proof parkas seemed essential. Those used by us were without fur, as fur would wet, mat and freeze. We wore woolen underwear for the high climbing, with wind-proof, light canvas trousers and heavy woolen shirts. We wore no vest or jacket, but relied for extra warmth on an extra wool shirt and the parka. The best covering for the hands we found to be a fingered woolen glove with an oiled leather mitten covering which was removable. These gloves extended well over the wrist.

The most difficult problem was that of footwear. Hobnailed shoes had proved to wet through and chill quickly no matter what efforts were taken to make them water-proof. We therefore wore only regulation shoe-packs, the lower part, as far as the instep, of rubber, the uppers of leather. These shoe-packs were of large size, allowing room for two felt in-soles and at least two pairs of heavy woolen socks. In all snow work, except when traveling on snow-shoes, crampons were worn and were very satisfactory. Ski boots had to be carried for use on skis at the lower levels. If one can use them, skis are better in glacier travel than snow-shoes, for they can be worn to advantage on slopes where snow-shoes have to be dispensed with.

If a climb were contemplated where there was much rock work, hobnailed shoes or rock-climbing shoes suitable to the occasion would have to be carried. The rubber-soled shoe-packs, with or without crampons, were unsatisfactory in crossing the two bands of rock and made climbing more difficult. Several pairs of extra felt in-soles were carried by each of us. There is considerable condensation of moisture in shoe-packs and sometimes in a few hours the felt in-soles next to the rubber soles were saturated. Fresh in-soles were then put in and the wet ones placed to dry. In-soles can be changed during a climb if the feet get cold. Socks, protected by in-soles, usually stay comparatively dry and warm.

Three of us used the Wood's Arctic Sleeping Bags, and one used a Wood's Arctic, Jr., bag with a very light down quilt fitted inside it. We always slept in perfect comfort, even with the temperature down close to zero. The Wood's Arctic, Jr., bag combination was about two pounds lighter than the standard Wood's Arctic Bag. In the sleeping-bag we always kept an extra suit of woolen underwear and an extra pair of dry woolen socks. It was necessary at times to wear a wool shirt for warmth when sleeping.

SUPPLIES TAKEN TO 9,000-FOOT CAMP ON MAY 25TH

12 small cans of chicken
4 cans of sardines
3 lbs. cheese
24 slices of bacon
2 1-lb. cans of dried eggs
4 lbs. nuts, raisins, hard-tack lunch mixture
1 lb. dried milk
1 lb. butter
12 individual packages of rye crisp
1 lb. dried potatoes
2 lbs. erbswurst
4 lbs. sugar
2 1½-lb. cans jam
2 tins cocoa
1 box bouillon cubes
A little tea, salt and pepper.

SUPPLIES REMAINING AT 5,000-FOOT CAMP ON MAY 27TH

4 lbs. milk
3 cans sardines
2 lbs. erbswurst
5 lbs. dried apples
8 packages rye crisp
1 slab bacon
3 lbs. chocolate
½ lb. rice
5 gals. gasoline
2½ lbs. dried potatoes
12 cans chicken
7 lbs. dried corn
15 lbs. boiled meat
2 1½-lb. cans jam
2 plum puddings
2 lbs. ham
1 lb. raisins, dried
12 lbs. hard tack
2 lbs. butter (3 more down 6 miles)
2 cans cocoa
7 lbs. dried eggs
5 lbs. honey
1 lb. apricots, dried
4 lbs. cheese
10 lbs. sugar
Had to melt snow for water.

Much has been written about physical conditioning for climbing. On trips such as these, where there is a long approach and constant back-packing of equipment, we found ourselves in excellent condition by the time the actual ascent was to be made. With one exception, all lost considerable weight. Our loads on the lower levels usually ran from sixty-five to eighty-five pounds. I found from experience that in glacier travel more than sixty pounds tended to interfere with secure footing and recovery of balance. This would, of course, vary with the strength of the individual. Above 9,000 feet on Mt. Fairweather, we carried fifteen or twenty pounds, consisting of a little extra clothing, a lunch and photographic material.

The Mountains and Glaciers of Prince William Sound, Alaska

Wm. Osgood Field, Jr.

At the northern apex of the Gulf of Alaska where the coast of the North American continent swings around from a northwest to a southwesterly direction is a large protected body of water known as Prince William Sound.[1] It resembles a great inland sea dotted with islands and extended in three directions by long inlets and fiords. Everywhere the land surface rises abruptly from the water for the sound itself occupies a depressed portion of a former mountain range whose summits are now represented by the numerous islands.

On all four sides of the sound are mountains covered with snow most of the year and harboring glaciers of almost every type and description. These peaks attain elevations of from five to six thousand feet on the large islands to the south; from six to seven thousand feet on the mainland to the east and west; and over twelve thousand feet on the north. In the latter direction is the real alpine paradise of the region. Here are the highest summits of the western part of the Chugach Range which bends around the northern side of the sound in one of the most rugged and spectacular mountain systems to be found on the continent. It includes more than a score of 10,000-foot peaks, of which at least four are over 12,000 feet. The highest of these is a beautiful snow summit 13,250 feet high, which rises among a group of high mountains eleven miles from the head of College Fiord.[2] It is in such a locality that one finds some of the finest fiord and glacier scenery of the whole world.

Since my first glimpse of this region from a passing steamer in 1925, it had been my hope to spend some time there, free to go where I wished among the fiords and inlets. Two features made especial appeal: first, the main peaks of the Chugach Range of which little was known, and second, the great glaciers

[1] Named by Capt. James Cook in 1778. Later it was also known as Chugach Gulf.

[2] Name given by the Harriman Alaska Expedition in 1899 which also named the glaciers of this fiord after American colleges and universities.

which flowed from them into the northern waters of Prince William Sound. Although their ice fronts had been accurately studied between 1899 and 1914, practically no data had been obtained since, so a visit promised some interesting and perhaps startling disclosures.

An opportunity presented itself late in the summer of 1931 when quite unexpectedly I found it possible to return to Alaska for a period of six weeks. A small gas boat was chartered at the town of Cordova in the southeastern part of Prince William Sound and with little delay our small expedition set off on its cruise to the various glaciers of the inlets to the north. Our vessel was the *Virginia* owned and expertly run by the brothers Rex and Ronney Hancock of Cordova with Charley Lilygren as assistant pilot. Completing the party was Andy Taylor who a few months before had been with the successful Ladd-Carpé Expedition to Mt. Fairweather. Then a month later we were joined by Sherman Pratt and Jack Wood, both of New York, who spent the last two weeks with us.

Our work was confined mainly to the actual study of the ice fronts, which involved occupying former photographic and measurement stations, map-making, and general observations. No purely mountaineering ventures were undertaken although on several occasions it was found necessary to make fairly extensive climbs up the glaciers for views of the surrounding country. The party, however, was neither equipped nor organized for any major ascent and the lateness of the season made the attempt of such an undertaking quite inadvisable.

MOUNTAINEERING HISTORY

The history of mountaineering in this part of the Chugach Range is a short one. The writer knows of no major peak that has been climbed or whose ascent has ever been attempted. The only recorded mountaineering expedition to visit this region was that of Miss Dora Keen in 1914 which climbed eighteen miles up the Harvard Glacier to explore its upper reaches and to search for a pass leading across to the north slope of the range. After more than three weeks of constant work relaying up the glacier the party was stopped by tremendous ice-falls at an altitude of 6,100 feet.

Photo W. O. Field, Jr.

MT. MUIR (7,640 FT.), AND SERPENTINE GLACIER FROM HARRIMAN FIORD LOOKING NORTHWEST

The pass across the range is at the extreme right

Photo W. O. Field, Jr.

THE ACTIVE ICE FRONT OF MEARES GLACIER AT THE HEAD OF UNAKWIK INLET, LOOKING NORTHEAST

One of the most beautiful localities in Prince William Sound and rarely visited

Photo W. O. Field, Jr.

THE CHUGACH RANGE LOOKING NORTHEAST UP THE MAIN TRIBUTARY OF MEARES GLACIER

However, other than strictly mountaineering parties have visited the upper portions of some of these glaciers. In 1898 over 4,000 prospectors and some United States Army detachments journeyed across the Chugach Range to the interior of Alaska by way of the Valdez Glacier route.[3] This led up the Valdez Glacier to the snow fields at its head and then descended the northward-flowing Klutena Glacier, a total distance over the ice of twenty-four miles. There was naturally much suffering among the ill-prepared men, for the hardships were great, and several fatalities occurred; but gold was ahead and, therefore, mountaineering technique and proper precautions were for the most part forgotten. Later, in 1911, veins of gold and other minerals were found in the mountains north of Prince William Sound and almost immediately several hundred prospectors began exploring the country. During the next few years the upper sections of several of the big glaciers were visited in what later turned out to be a highly impractical search for these precious metals.[4] The snow-fields at the head of the Columbia Glacier were reached at this time and one party is reported to have made the long trip northward across the range to the Matanuska Valley district. Actually several mines were established up the Columbia, Shoup, and Valdez Glaciers,[5] but the difficulties of approach over the ice were in most cases too great so in the end few of them were financially successful.

Thus one may summarize the mountaineering activities in this region as having been entirely confined to glacier travel, during which it seems probable that prospecting parties have attained elevations of 7,000 and possibly even 8,000 feet. However, the ascent of any major peaks by them or anyone else has never been recorded and is extremely improbable.

PEAKS AND GLACIERS

Many of the high peaks on the crest of the range and its southern slope have been triangulated from distant points and, as a result, the main features of the glaciers hereabouts have been determined, but the details are still very imperfectly understood.

[3] For references see note at end of paper.
[4] Information from Chris Peterson of Valdez, Alaska.
[5] For references see note at end of paper.

Except for the foregoing, a large part of the main range, including practically all of its northern slope, is still unmapped and the altitudes of the peaks and the main topographic features are unknown. Large glaciers flow northward into the Matanuska Valley and it is assumed that they all rise near the center of the range, in some cases forming "through" glaciers with those flowing south into Prince William Sound.

A discussion of the different mountains can be undertaken only in the briefest and vaguest manner. Several fine peaks exist between the head of the Valdez and the Columbia Glaciers but this portion of the range is little known and one can only guess their height to be from 7,000 to 8,000 feet. Up the Columbia Glacier there are several mountain groups with peaks rising to altitudes of 10,000 feet. These, however, are mostly unmapped and but one or two are named. The difficulties in getting to them are not great beyond the necessity of packing fifteen to thirty miles in from the coast over the intervening glaciers where in the early spring sleds can be used to advantage. To the west of the Columbia, around the upper basins of Yale and Harvard Glaciers stand the highest peaks of the range. Their bases can be reached by traveling up these long gently sloping ice-streams but the cascading tributary glaciers issuing from the upper snow-fields and the peaks themselves render further progress extremely difficult. This factor serves to make the ascent of most of these peaks from the south side a formidable undertaking even in spring when glacier travel is at its best. In the case of the peaks situated on the watershed, which includes several of the highest summits, there is practically nothing known of their northern slopes. What routes of ascent there may be on that side can only be conjectured, but it is the writer's opinion that the climb from that direction should prove more practicable than from the south. The best preparation would be to fly over the region in order to make careful notes of the topographic details and the possible routes of approach and ascent.

The mountains on the northwest side of Prince William Sound between College Fiord and Passage Canal which include the prominent summits which rise above Harriman Fiord[6] should afford

[6] First explored and named by the Harriman Alaska Expedition.

Photo W. O. Field, Jr.

PEAKS AT THE WESTERN END OF THE CHUGACH RANGE AND HARRIMAN GLACIER AT THE HEAD OF HARRIMAN FIORD

View southwest

Photo W. O. Field, Jr.

SUNSET IN HARRIMAN FIORD SHOWING CATARACT GLACIER AT THE LEFT, SURPRISE GLACIER IN THE CENTER, AND A SHOULDER OF MT. MUIR AT THE RIGHT

Photo W. O. Field, Jr.

PEAKS OF THE CHUGACH RANGE TWENTY-FIVE MILES UP COLUMBIA GLACIER

View northwest from 4,400-foot pass between Shoup and Columbia Glaciers

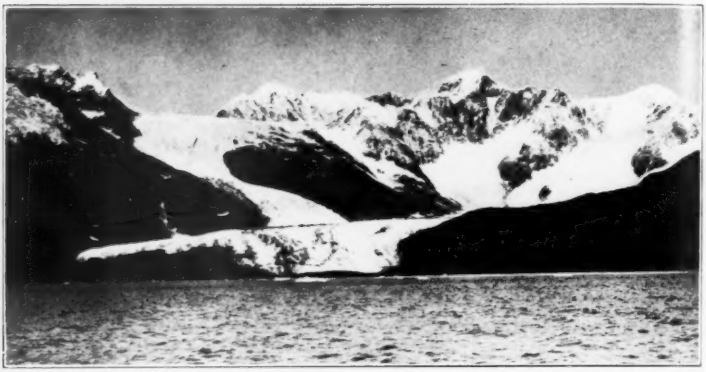


Photo W. O. Field, Jr.

VIEW NORTH ACROSS HARRIMAN FIORD TO SERPENTINE GLACIER AND MT. GILBERT (9,550 FT.)

Above the flat skyline of Serpentine Glacier (left center) is a 4,250-foot pass leading across the Chugach Range and giving access to the northwest slopes of Mts. Muir and Gilbert

Photo W. O. Field, Jr.

LOWER PART OF COLUMBIA GLACIER FROM SUMMIT OF HEATHER ISLAND IN COLUMBIA BAY, LOOKING NORTH

Prominent snow peak of the Chugach Range in left center is 11,620 ft. high

some excellent mountaineering. Several of these peaks, notably Mt. Muir (7,640 feet) and Mt. Gilbert[7] (9,550 feet), rise so near the water's edge that the difficulties are confined to the actual ascent of the peaks. A further advantage is that there are one or two passes through this part of the range which make it possible to reach the northern slopes while maintaining a base of operation on the shore of the inlets to the south.

The numerous glaciers issuing from the southern front of the Chugach Range and terminating in or near the waters of Prince William Sound are of special interest. In complete contrast to the conditions found in Glacier Bay 400 miles to the southeast, where the ice-fronts have been retreating fairly steadily for over a century, the glaciers of Prince William Sound are now in many cases more advanced than has been the case for a very long time. As a result, we often find luxuriant forest growing in very close proximity to the glaciers, forming a magnificent contrast of color and enhancing many times the beauty of their tidal fronts.

The chief ice streams enter the northern side of the sound where from Valdez Glacier on the east to Harriman Glacier on the west there are eleven active tidal glaciers and many more large and small that terminate on land. The giant of the whole region is the Columbia, flowing from unexplored parts of the Chugach Range as a broad river of ice three to six miles wide and fully thirty-five miles long. Its terminus is seven miles across. For two and one-half miles fronting on Columbia Bay extends a magnificent active ice cliff which, owing to its accessibility, is enjoyed by most of the summer passengers on the steamers plying the southwestern Alaska route.

To the west of the Columbia are long fiords and inlets seldom visited and yet so close to the regular routes of travel that but a day's trip on a small boat is required to reach any one of them. Here are glaciers one to two miles wide and up to twenty miles in length flowing down through tremendously deep valleys hemmed in on either side by towering peaks whose summits and slopes are almost completely covered with magnificent hanging glaciers.

[7] Named after John Muir and G. K. Gilbert of the Harriman Alaska Expedition.

GLACIAL STUDIES

To undertake a study of the glaciers of this region should appeal to mountaineering enthusiasts who desire to combine additional work of a practical and useful nature with a moderate climbing holiday. Serious climbing in Alaska requires a better equipped and organized party than in the Canadian Rockies or the Alps, owing to the greater scale. This makes it hard for the average mountaineer to work successfully among the really big peaks of the country. But Prince William Sound offers a happy compromise in its opportunities for glacier observation and for climbing accessible lesser peaks.

The actual technical knowledge and preparation required for the observations need not deter the amateur, for very valuable work can be done by simply photographing from designated stations the various ice fronts so as to show their positions in relation to nearby landmarks. Comparison of these pictures with earlier ones taken from the same spot, indicates the changes in the position or condition of the ice fronts. Furthermore, at certain glaciers, it is possible to recover old monuments from which accurate measurements of the advance or retreat of the termini can be made.

The need of observations may be realized when we recall that between 1914 and 1931 no careful studies were made of the Prince William Sound glaciers, although a few of the ice fronts were visited and photographed. For the remaining glaciers of this district the only clue to their recent behavior is the physiographic evidence which in most cases is inadequate and far less satisfactory than if regular observations had been made at about five-year intervals. It was a desire to reconstruct this past history of the various ice fronts and to record their exact positions and conditions in 1931 that prompted the writer's expedition. The intention was to study all the glaciers of Prince William Sound, but owing to the detailed nature of the work and the short amount of time allotted, it was found necessary to omit those on the west side of the sound. These and most of the glaciers of the southern coast of the Kenai Peninsula, therefore, still remain unstudied since 1910. A similar situation exists in the case of the important ice tongues entering Disenchantment Bay and Russell Fiord in the Yakutat Bay district. Like the Prince William Sound

glaciers they were carefully studied early in the century but no record of their behavior since 1913 seems to be available.

The study of glacial fluctuation involves considerably more than merely recording the oscillations of the ice fronts. Among other factors, it includes a detailed record of meteorological conditions at the glaciers and fairly complete knowledge of the size and configuration of the glacial basins. Another important factor is the temperature of the water into which the glaciers discharge, for if this increases or decreases it would immediately affect the ice fronts and would probably cause a change in their positions. These and many other branches of the study have as yet hardly been approached and their importance can be but vaguely surmised.

Future observations of the Alaskan glaciers are by no means assured for they will have to depend very largely if not entirely on voluntary work. However, the chances of systematic study are greatly increased by the recent formation of a Committee on Glaciers as part of the Section of Hydrology of the American Geophysical Union. It is recognized that, in addition to its scientific value, the subject possesses considerable economic importance. Already a collection of photographs of the North American glaciers is being made as a permanent pictorial record which will be added to from year to year as newer pictures are secured. Further, it is hoped to issue a yearly report of all glacier studies. Active work for the present will consist of helping to organize new research through governmental agencies or private enterprise. As an example, the Forestry Service has recently been enlisted to conduct annual observations of about twenty large glaciers in southeastern Alaska. Work in other sections will be more difficult to organize but at any rate a new element of systematization is being introduced which should produce more valuable results than has heretofore been possible.

OBSERVATIONS MADE IN 1931

Space permits but a brief summary of the observations of the recent oscillations of the glacier fronts visited by the author in September and October, 1931. For clearness the glaciers will be discussed in the order of their positions beginning at the eastern side of Prince William Sound and proceeding along the coast toward the west.

Glaciers of Valdez Inlet

Valdez Glacier retreated about 1,240 feet between 1914 and 1931—an average of 73 feet per year. There may be a slight margin of error in this figure as the old monuments have been partially destroyed in the intervening seventeen years and are, therefore, difficult to identify precisely. The recent history of the glacier is, therefore, one of retreat amounting to 1,948 feet since 1901, broken as far as known by only one short spasmodic advance of a few hundred feet about 1906.

The terminus of Shoup Glacier has not materially changed position since 1898, but its appearance has been altered from that of an active discharging tidal ice cliff to a sloping inactive front scarcely reaching salt water even at high tide.

Columbia Glacier

Columbia Glacier, the largest and longest ice stream in the Prince William Sound region, has a lobate terminus of about seven miles in length.

At the west margin of the terminus we find that the ice retreated about 800 feet between 1892 and 1899. Then an advance set in about 1908 which by 1911 amounted to over 1,700 feet. A slight retreat appears to have followed until sometime soon after 1914 when a further advance of about 100 feet occurred. A retreat then set in which continued till 1930 or 1931, followed by a slight advance which was in progress in September of the latter year. The ice front at that time stood 900 feet back of its most advanced position since 1914 and about the same distance in front of the 1899 position.

Near the center of the ice terminus where the ice rests on the northern extension of Heather Island there have been various oscillations corresponding very closely to those of the west margin. A retreat occurred between 1892 and 1905, then by 1908 an advance set in which in 1910 had amounted to 742 feet. After 1914 a further advance of fully 200 feet occurred. The subsequent retreat has amounted in this part to from 200 to 250 feet, but again as at the west margin, there was a distinct advance observed in progress in September, 1931.

Immediately east of this, along the so-called eastern ice cliff the recent retreat has amounted to from 1,500 feet near the

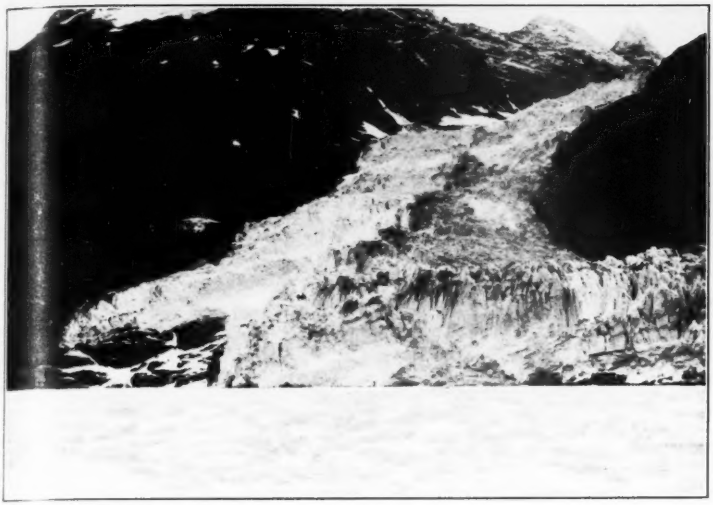


Photo W. O. Field, Jr.

THE LOWER ICEFALL OF CASCADE GLACIER. 3,000 FT. IN HEIGHT. LOOKING WEST

Below and to the right is part of the ice front of Barry Glacier

Photo W. O. Field, Jr.

BRYN MAWR GLACIER IN COLLEGE FIORD CASCADING FROM SNOWFIELDS AMONG 10,000-FOOT PEAKS

View southwest

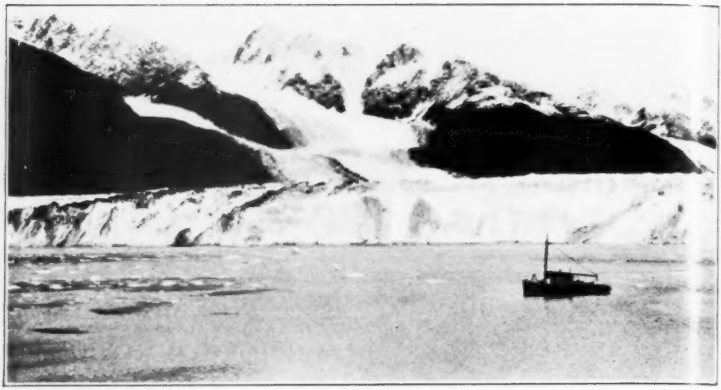


Photo W. O. Field, Jr.

THE *VIRGINIA* AT THE HEAD OF COLLEGE FIORD

View north showing the ice front of Harvard Glacier and above it the cascading Radcliffe Glacier. Low clouds obscure the highest peak of the range (13,250 ft.), which rises twelve miles away and almost directly in line with the boat.

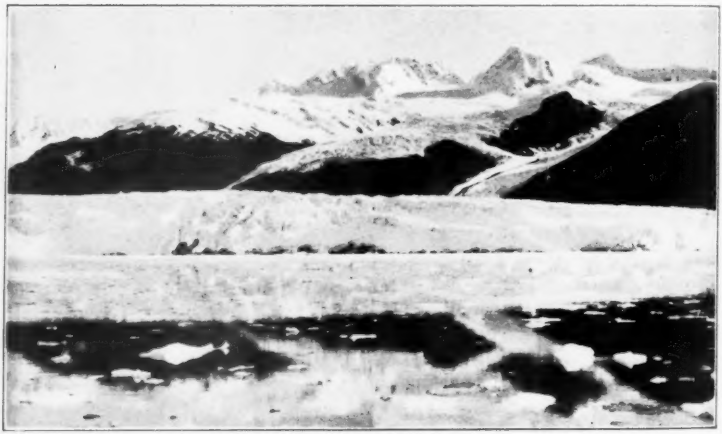


Photo W. O. Field, Jr.

YALE GLACIER TERMINATING IN THE EAST ARM OF COLLEGE FIORD

View east toward a group of 6,000-foot peaks

west margin to 2,500 feet at the east end. The eastern land terminus has fluctuated in a very similar manner to that of the other land fronts and its recent retreat has amounted to from 400 to 800 feet.

Glaciers of Unakwik Inlet

The small glaciers of this inlet are all in a state of retreat, but the one large ice stream, Meares Glacier, has been advancing for some years. After what the writer interprets as fully a two-mile advance between 1898 and 1905 the ice front has since come forward several hundred feet more. Every observation has shown this terminus to be progressively further forward than the last. Meanwhile it is clear that only the northern tributary is contributing this forward impulse and that the eastern tributary is at present shrinking and its terminus would probably be retreating if its position were not influenced by its neighbor.

Glaciers of College Fiord

The center of the ice front of Yale Glacier has remained in the same position from 1898 to the present day. However, the east margin advanced about 750 feet between 1899 and 1910 and several hundred feet more since that date. Recently there has been a slight retreat of the east and west margins from their most advanced positions.

Harvard Glacier has been observed to be steadily advancing in recent years. From 1899 to 1905 there was little change at the east margin, then an advance set in which by 1910 exceeded 700 feet. Little change took place until after 1914 when an advance of from 1,300 to 1,400 feet took place at this point. This was still in progress in 1931. The west margin has also advanced but probably not to as great an extent.

The termini of the four large cascading glaciers on the west side of College Fiord have behaved somewhat differently in the last twenty years. Smith Glacier experienced a considerable increase in volume after 1914 and has since then shrunk to less than its former size. Bryn Mawr Glacier advanced about 500 feet between 1905 and 1909 and continued this till after 1910. Another advance occurred after 1914 followed by a retreat of 1,500 to 2,000 feet which by 1931 placed the ice front several

hundred feet back of its 1899 and 1905 positions. Vassar Glacier has probably experienced oscillations similar to those observed at Smith and Bryn Mawr Glaciers but on a smaller scale for its lower portions are so covered with moraine that the ice is too well protected to respond quickly to delicate readjustments. In almost direct contrast to these is Wellesley Glacier which although advancing in 1910, had retreated again by 1914 to a point back of the 1899 and 1905 positions. By 1931 part of the ice front had again come forward and occupied a more advanced position than previously observed.

Barry Glacier

Between 1899 and 1914 the front of Barry Glacier experienced the most spectacular retreat of the region. During these fifteen years there was a retreat of over three miles which caused one tributary glacier to become an independent ice tongue and all but freed another. Since 1914 there has been little change in the position of the terminus but photographs taken in 1925 suggest that the glacier was smaller in volume that year than either in 1914 or 1931.

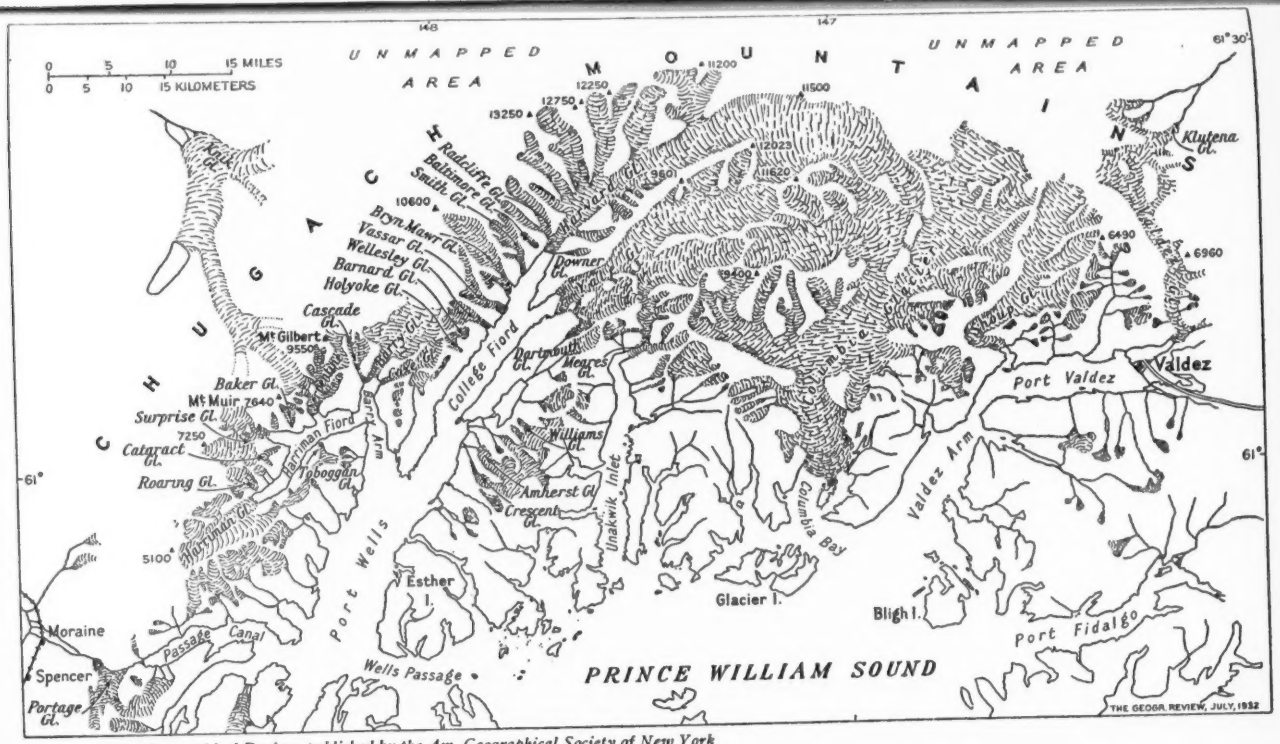
Glaciers of Harriman Fiord

Serpentine Glacier retreated about one-quarter mile between 1905 and 1909, then during the next five years there was little change in the position of its terminus. Between 1914 and 1931 there was an additional retreat of about 1,000 feet along the east margin and about 2,000 feet at the west margin.

Baker Glacier, a very small hanging glacier, is interesting because of its relatively great oscillations, for although less than two miles in length its terminus advanced about 1,000 feet between 1909 and 1914. A subsequent retreat had by 1931 restored the ice front to its position of 1905.

The tidal terminus of Surprise Glacier retreated about one and one-tenth miles along its southern margin between 1899 and 1909. Since then its position at this point has remained unchanged, but between 1914 and 1931 there has been a retreat of about 2,000 feet near the center of the ice front.

Cataract Glacier, a small steeply cascading ice tongue, advanced between 1909 and 1914. In 1925 the volume of ice had greatly decreased but the terminus still reached tidewater. In 1931,



Courtesy of the Geographical Review, published by the Am. Geographical Society of New York

THE CHUGACH MOUNTAINS AND PRINCE WILLIAM SOUND

Sources: U. S. Government maps; sketch map of Harvard Glacier by Dora Keen, 1917; observations by the author, 1931

however, the conditions were reversed, for the volume of ice was greater than in 1925 but the terminus had retreated to dry land.

The oscillations of Roaring Glacier have been determined very largely by the condition of the ice block fan at the base of the cliffs overhung by the terminal portions of the glacier. This fan was present in 1899 but absent in 1905. It had reformed by

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1910 and had greatly increased in size by 1914, but in 1931 was again of small size. It is probable that in this glacier the increase or decrease in size of this ice block fan indicates whether the glacier is tending to increase or decrease in volume—a condition

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which in the case of most glaciers is measured by the advance or retreat of the terminus.

Harriman Glacier retreated on its east margin about 1,050 feet between 1899 and 1909 while the west margin experienced practically no change. An advance then set in which by August, 1910, amounted to more than 1,050 feet on the east and 700 feet on the west. This advance was observed to be in progress in 1914, 1925, and 1931, during which all parts of the ice front appeared to have come forward at least 600 feet during those twenty-one years.

Toboggan Glacier, being a valley glacier terminating on land, has lent itself to very specific measurements. Between 1905 and 1909 there was an advance of the terminus to a point 400 feet beyond the 1905 position followed by a retreat of 652 feet. From 1909 to 1910 there was a further retreat of seventy-five feet, and from 1910 to 1931 the total retreat was 832 feet—an average of nearly forty feet per year.

CONCLUSION

The results of these observations indicate that with several notable exceptions there has been a fairly steady retreat and shrinkage among these glaciers during the last decade or decade and a half. That this is not a part of a widespread retreat which has been in progress for a long period of time is proved by the fact that within the last thirty-two years nearly half of the more prominent glaciers of this region have extended their fronts over terrain not occupied by ice for at least the previous one hundred years. This is conclusively shown by the position of mature trees and forests close to the termini of these glaciers. Further light on the relationship of these fluctuations to those observed among other glaciers or to any possible climatic cycle can be revealed only by more observations during the next few decades.

Some Climbs in the Selkirks

GEORGIA ENGELHARD

AFTER two weeks of climbing in the Canadian Rockies, where the brittle limestone rock is always a menace, where one often toils arduously up long scree slopes until one reaches the actual climbing, and where we had been sinking up to our knees in soft snow on the ice-fields of the Yoho Valley, it was indeed a joy to grip the solid quartzite of the Selkirks. Here one can quite safely hang by the very tips of one's fingers on almost vertical rock faces, and, besides, there is the delight of walking through shady forests of huge evergreens which provide rich dark frames for glistening glacier tongues that sprawl downwards into deep valleys.

On August 3, 1931, the Swiss guide, Ernest Feuz, and I arrived at Glacier and made our headquarters with the very hospitable fire warden, Bill Hartley, and his wife. The great advantage of Glacier as a climbing center is that not only are the peaks all quite accessible, but even those of not very great altitude often offer difficult climbs on which one can develop technique without expending too much energy in reaching the interesting part. Many of the peaks, such as Mt. Rogers and Mt. Hermit, have easy routes, with more exacting ones as well for the experienced climber. It is my purpose in this paper to describe a few of the less well-known ascents out of the twenty-four which we made during our three weeks' sojourn in this Canadian Switzerland.

Terminal Peak (9,991 feet) is in reality a rocky spur on the southeast side of Mt. Sir Donald, and appears like a buttress rising above the much-crevassed expanse of the Illecillewaet Glacier. On August 8, at 4 A.M., Ernest and I set out in the shadow of Sir Donald's massive peak, from whose summit a golden cloud banner streamed into the pure morning air. Reaching the glacier at Perley Rock, we climbed steeply up it to the base of our peak, which rose a vertical wall, 2,000 feet above us. After a bite of "second breakfast" we put on sneakers and started up the north face. We encountered some difficult pitches where

the only holds were those of friction. To add to the difficulty, the smooth rock, although apparently dry, was quite moist, and proved exceedingly slippery under our rubber soles. After an hour on the face, we gained the sharp knife-like ridge which rises abruptly several thousand feet from the green Beaver Valley, with the Beaver River like a silver ribbon curling down it. We proceeded along this arête, encountering interesting overhangs in several places, and gained the tiny summit, five and one-half hours after our departure from Glacier. And we were amply rewarded for our labors. Close at hand towered the eastern walls of Sir Donald, while to the south and west as far as the eye could see lay snowfields bordered by peaks; to the east, across the rolling Prairie Hills, the Rockies, from Mt. Assiniboine to Mt. Columbia, glittered in the blue distance. Among them old friends, such as Victoria, Vaux and Balfour, from which I had earlier in the season scanned the Selkirks, were easily recognized. After an hour on the summit, we made our descent by the fairly easy west face, to the glacier, a few hundred yards from where we had left our boots in the morning. However, crossing glaciers in sneakers, even for a short distance, is not to be recommended.

The next day, we walked to the Hermit Hut, which we made our headquarters for the three days following. We climbed Mt. Tupper (in three hours from the Hut in a fog which hid the peak from us until we were within 500 feet of the summit), and Mt. Hermit, which provides an hour and a half of first-class rock work, and made the traverse in five and a half hours of Mt. Rogers (by the southwest rock ridge), Mt. Fleming, Grant Peak and Swiss Peak. All of these involve not only excellent rock work, but interesting stretches of ice and snow as well. They come closer than any peaks in Canada that I know of to resembling the aiguilles of Chamonix, and although considerably lower, provide bits of climbing which are unrivalled. We descended to Tupper Glacier by a very steep snow couloir on the east face of our peak and regained the Hut in three hours.

Later in the same week, after having climbed Sir Donald by the magnificent northwest ridge in six hours and twenty minutes from Warden Hartley's cabin, we proceeded to the Nakimu Caves in Cougar Valley. Here we had two days of climbing on the rocky peaks bordering that charming alpine valley, with its sparkling, flower-bordered streams and grassy uplands. The

ascent of Copper Peak, at the head of the valley, a sharp pinnacle, proved to be the most difficult climb of the summer, although less than 9,000 feet in height. On August 17, we left the tea-house at 5 A.M. and walked up the gradual slopes of the Cougar Valley to the base of Copper Peak, which rises with startling abruptness from the alplands. The ascent by the south ridge is very spectacular, being on continuously exposed faces, sometimes by tiny ledges along which one's feet move with infinite caution, while one's fingers clutch any minute crack or prominence on the smooth rock, and sometimes by wriggling up splits in the rock, with but one foothold, the other foot dangling in space. The peak provides two good hours of such work, where every faculty must be alert and every muscle in proper coordination so that movements may be quick yet certain.

From the rusty summit of Copper Peak we descended a jagged ridge to a little col between that peak and Mt. McGill, up whose slabby south face we made our way, encountering an interesting chimney and a good deal of rock with unfavorable stratification. It was noon when we reached the summit, and the day being exceedingly warm, we spent a couple of hours basking in the sun. We were only roused by the annoying attentions of an eagle, whose insistent swooping in our direction finally drove us to our descent by the west ridge of McGill to the tiny glacier at its base.

The next day we climbed Mt. Bagheera, the highest peak of the Cougar Range, by the long west arête, which was always interesting, but only presented two places where there was any really serious climbing. We had intended to make a complete traverse of the mountain, but the approach of a thunderstorm drove us off our peak via the south face, and we returned to the Caves at 1.30 in the afternoon.

A few days later, after making the traverse of Dome, Rampart and Afton, rocky sentinels of the Asulkan Valley, and after having been forced by the weather to take an unwelcome rest, we made the ascent on August 28 of Mt. Macoun (9,989 feet), which was one of the most enjoyable expeditions of the summer. Not only were the crossing of practically the entire length of the Illecillewaet Névé and the rock work on Macoun of great interest, but I also saw Glacier Circle and the Dawson group near at hand.

It was a most unpromising morning when we started, being suspiciously warm and sultry, with thick fogs hanging way below timberline. We made our way up the steep trail to Perley Rock, and when we stepped on to the ice at 6.45 A.M., yellow fogs were curling over the Hermit Range, and inky clouds descending upon the vast white snowfields over which our way lay. However, we proceeded steadily, threading our way among crevasses, and finding the snow, which had been melted into a trench-like formation by the sun's heat and which gave the glacier the appearance of a frozen ocean, rather annoying to walk upon. By eight o'clock we were well over to the southern end of the névé, about six miles from Perley Rock and two miles from the base of Macoun, whose black peak was still shrouded in dark clouds. After a short halt for second breakfast, none too pleasurable thanks to the cold and the fog, we proceeded again; however, in a slightly more hopeful frame of mind, as small patches of blue sky were appearing in the east, and there was a play of feeble sunlight on a few of the peaks.

By 8.30, when we had negotiated the rather difficult, if short, piece of rock work above the bergschrund at the base of Macoun, the morning was crystal clear, and the peaks were appearing one by one, glittering and proud, out of the enshrouding clouds, and even the distant Rockies, freshly snow-covered, sparkled with gem-like clarity against a sky of ethereal blue. Both Ernest and I were in ecstasies of delight, and we made fast work of the smooth slabs on the northeast face below the narrow jagged summit arête which one traverses a short distance to the peak. This was the second ascent of Macoun by this route. From the peak there is a commanding view of the Dawson Range and of the Deville Glacier, tumbling in a mass of séracs and crevasses into Glacier Circle, whose green meadows lay, a small spot of emerald set in a circle of peaks and glaciers, 5,000 sheer feet below us. Beyond to the south stretched an unrivalled panorama, while to the east the Rockies, and to the southeast the Purcells, seemed to lead into infinity.

After a two-hour sojourn, we descended by the west face, which at first offered no difficulties, so we unroped. But about half-way down we encountered some vertical bluffs which forced us to bear to the south. Eventually we arrived on the glacier much farther towards Glacier Circle than we had intended, for it

Photo G. Engelhard

CLIMBING COPPER PEAK

Photo G. Engelhard

SOUTH FACE OF MT. McGILL FROM COPPER PEAK

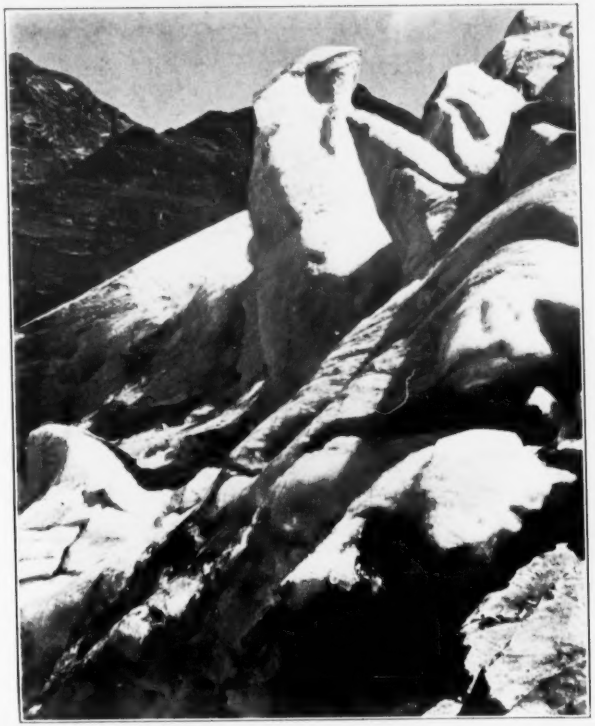


Photo G. Engelhard
SERACS OF ILLECILLEWAET GLACIER

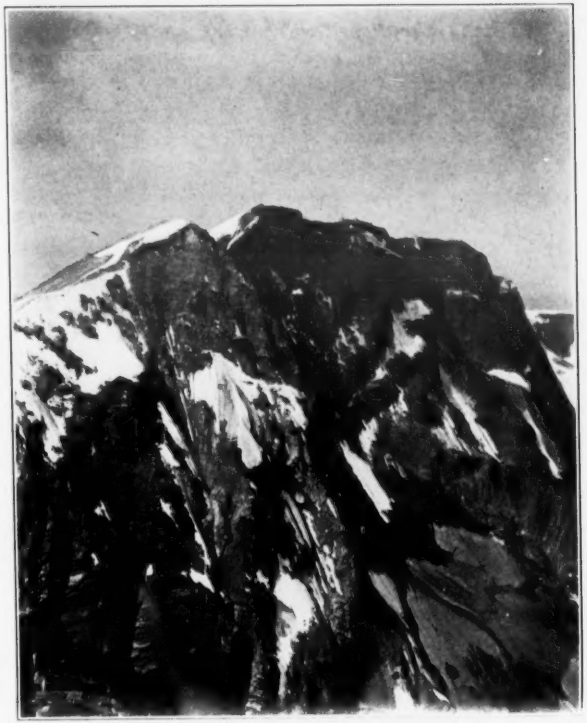


Photo G. Engelhard
CLARK'S PEAK (LEFT) AND MT. BONNEY FROM MT. SWANZY

lengthened our walk across the Illecillewaet Névé by a mile or more. Here we found that the strong sun had softened the ice considerably. In some places rushing streams had to be forded and the surface in general was very slushy. We arrived home just twelve hours after our start, and, after an ample supper, retired at about 9 P.M.

The clear weather now brought our long-deferred expedition to Mt. Bonney to the fore, so we arose at one the next morning, and with a lantern, started at 2.30 A.M. up the steep, wooded Mt. Abbott trail. The full moon was high in the sky, casting a silvery light on the Great Glacier, which sprawled like a giant octopus in the shadow of Sir Donald. By five o'clock we had scrambled on to the ridge of Mt. Abbott and beheld the unusual sight of the moon setting behind Mt. Bonney while the sun rose in the east, bathing the Asulkan Glacier and the snowy southern peaks in an almost blood-red glow. We descended from Abbott ridge on to the tiny, but exceedingly glassy, Afton Glacier, and proceeded thence around the shoulder of Mt. Afton over huge slabs of broken rock.

For the next two hours we traversed the lower ledges of Mts. Afton and Rampart, not altogether pleasurable work, in the direction of Lily Col, between Mt. Dome and Mt. Swanzy. We reached Lily Col at 7.30, five hours after our start, and from there it was only an hour of first-class rock-work up the steep slabs on the south face of Mt. Swanzy until we stood on its corniced summit. We had encountered nothing of particular difficulty, though it was all climbing requiring the use of hands and arms (not to mention fingers) as well as feet and legs. After a short rest we descended over snow and broken rock to the col between Swanzy and Clarke's Peak, whose summit was reached after a thirty-minute walk up broken rock. We then descended the narrow ridge, quite pinnacled, to the col between Clarke's Peak and Mt. Bonney, whose impressive vertical walls rose directly before us. However, we found the bluffs sufficiently broken to be quite easy to negotiate, and we gained the top (10,250 feet) at 11 o'clock, eight and one-half hours of practically continuous climbing. It was bitterly cold and windy, the view was badly obscured by smoke, and ominous clouds were gathering, so we halted only half an hour for lunch. We had originally intended to return by our route of ascent, but the large

SERACS OF ILLECILLEWAET GLACIER CLARK'S PEAK (LEFT) AND MT. BONNEY FROM MT. SWANZY

amount of uphill work and the disagreeable stretch from Lily Col to Mt. Abbott made us decide to try another route.

We unroped and proceeded to traverse the ridge of Mt. Bonney, which is quite broad and very easy going, sloping off gradually on the left to the huge Bonney névé, in strong contrast to the sheer drop on the right to the Bonney Glacier. It took us about an hour to traverse half the ridge, and finding a place on the north face which looked fairly easy, we started to climb down. Our descent was rapid and fairly simple to a point about 200 feet above the glacier, where we struck exceedingly smooth rock with a huge, yawning bergschrund, sadly lacking in snow bridges, at its base. For a while it looked as though we could not cross but an hour of reconnoitering disclosed a snow bridge, just strong enough to permit a rapid passage of two persons, and we thereby reached the glacier. Over this we sped, detouring around several large crevasses, too wide to be jumped. In another hour we unroped on the terminal moraine above some grassy meadows at the source of Loop Creek.

Then followed three hours of exasperating bush work above the bed of Loop Creek through thick underbrush, over deadfall, through masses of Devil's Club whose spines scratched our hands, and above the steep canyons, keeping ourselves from slipping down by holding on to the thickly laden blueberry bushes. At last we reached the stream bed, but high water forced us back into the forest again. The labor here was almost more than any actual climbing, and far less pleasurable. After a while we struck the old railroad grade, but even that was so overgrown with alders that it was difficult to travel along and not until five o'clock did we crawl out of the underbrush near Glacier station hot and dirty, stained with huckleberries and our clothing and hair full of evergreen needles. A little later, we arrived at Hartley's, just in time to avoid a violent thunderstorm. We were not sorry to be able to rest after seventeen hours of almost constant climbing, though we were by no means too tired to do justice to Mrs. Hartley's excellent cooking.

We left Glacier the next day. But I shall always look back upon those three weeks as holding some of my pleasantest memories of fine and varied climbing, and of unparalleled scenery. Nor shall I forget the excellent company and guiding of Ernest, who did all within his power to make every ascent as engrossing and pleasurable as possible—and who certainly succeeded.

The Grand Teton by the North Face

FRITIOF M. FRYXELL

IN the history of the Grand Teton, the climbing season of 1931 will probably take rank as the most notable. Early in the summer, two wholly new routes to the summit and one partly new, were added to the two previously available.[1] There remained the great north face, so forbidding in aspect that most climbers had, upon casual examination, dismissed it as hopeless.

Being unwilling to accept such an offhand verdict, however, Robert L. M. Underhill and the writer last summer resolved to put the mountain's defenses in this quarter to actual test. Accordingly, on July 20th we left Amphitheater Lake camp at 5.30 A.M., crossed to Teton Glacier, and, dodging open crevasses by keeping well to the right, cut steps up to the *randkluft*. Turning sharply left we followed the margin of the ice and encircled the head of the glacier. We rejected the couloir leading up into the Notch, since boulders were coming down through it on to the glacier, and continued to the base of the north precipice. Here we turned right, threading a course through the yawning crevasses and shattered snow-walls of the *bergschrund* to the rocks beyond, reached at 8.20 (altitude about 11,000 feet).

Being equipped only with common work shoes (the failure of my pack outfit to arrive at Amphitheater Lake the day before had left me without climbing equipment, except for my axe) I had docilely followed in Underhill's spacious footsteps while ascending the glacier, but now I was able to take my turn at lead. We started up the steeply inclined ledges which reach up to the north shoulder of the Grand Teton, keeping safely out from beneath the 3,000-foot precipice the first half of the way and close in to it the second half, where overhangs protected us from the intermittent bombardment of rocks. At 9.55 we reached the angle where the north shoulder meets the "north corner" (the latter is formed by the union of the north and northwest faces).

[1] See "The 1931 Mountaineering Season in Grand Teton National Park," p. 535.

We found ourselves at an altitude of about 12,100 feet, and within arm's reach of the fearsome north face, rising nearly 2,000 feet from the shoulder on which we were perched. It was entirely in shadow and a cold wind swept across it from the west. Two lines of attack were evident: By a horizontal ledge extending out across the northwest precipice in the direction of the upper saddle, and by a steeply inclined ledge leading upward toward the right around the north corner. Far up the wall we could see a chimney which the latter ledge might enable us to reach; hence we decided in favor of it—a wise choice as it proved, since the other ledge was later seen to pinch out on the northwest face.

After ten minutes spent on the shoulder Underhill led off up our ledge. It proved most insecure both because of its narrowness and because of the rotten condition of the rock, but it served to conduct us to the base of a north-facing wall 150 feet high. This we managed to scale with difficulty. There followed a 75-foot traverse left to an easy gully which brought us out on a shoulder. Clearly we had reached the *first* step of the north wall, as one sees it in profile from the east.

We continued diagonally right up steep rock faces for seventy-five feet to the foot of a deep narrow crack rising left. Higher this crack developed into a vertical chimney, the inner angle of which at the bottom and higher up was filled with snow and ice. Leaving pack and axe behind—for only so could he squeeze into the crack—Underhill climbed slowly up the chimney to the first stance, sixty feet above. From here he called down to me that the going was pretty "strenuous." Having sent up the packs and axes to Underhill, who dug them into the snow behind him, I came up the crack, climbing even more slowly, and finding good reason to accuse my partner of gross understatement.

But the difficulties of this chimney were immediately forgotten in the face of the real crisis which now confronted us, for that portion of the chimney immediately above us consisted of a vertical rise of at least fifteen feet, beyond which it was blocked by a chockstone so huge that it extended well out over our heads.

Would a *courte-échelle* go? Five feet out on the sheer right-hand (west) wall of the chimney we both found toe-room and I, being by fifty pounds the lighter, climbed to Underhill's shoulders, then to his head. From the latter position (quite unique in my

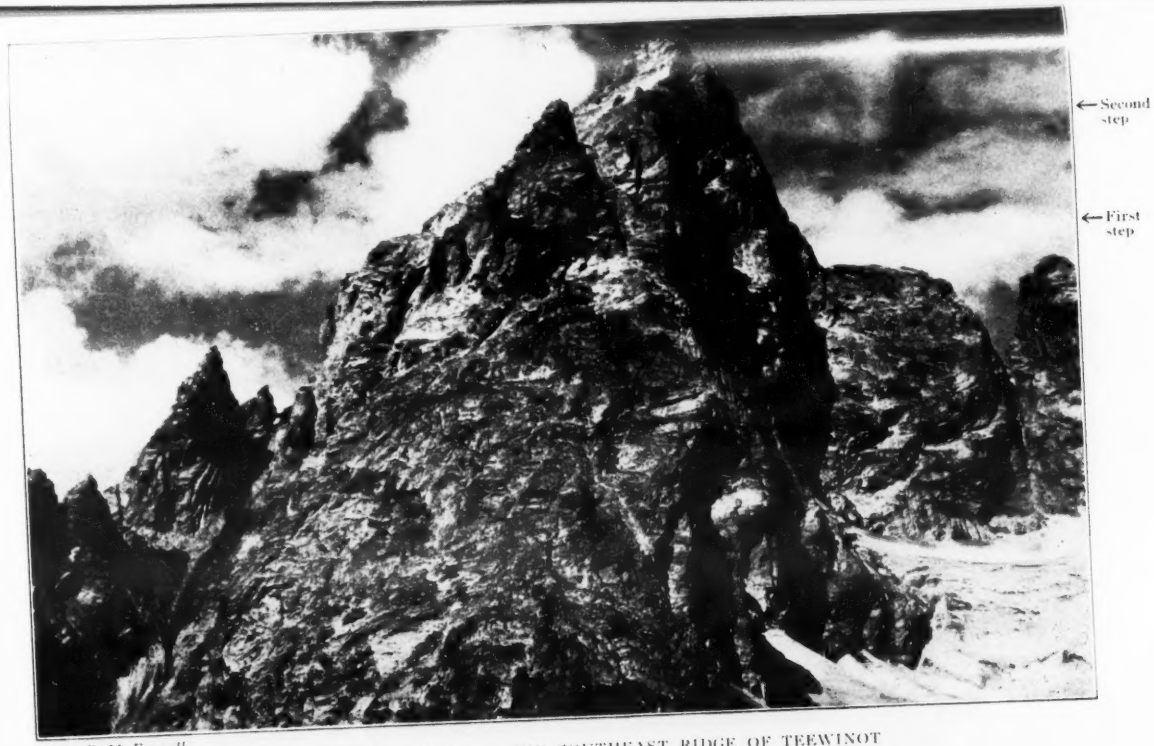


Photo F. M. Fryxell

THE GRAND TETON FROM THE SOUTHEAST RIDGE OF TEEWINOT

The North Face is in profile at right

experience) I could just reach the lower part of the chockstone. Keenly conscious of the fact that success or failure was now at issue I searched desperately for some slight hold by means of which I could get started up this pitch and so attain the chockstone, but nowhere within reach, on or around the chockstone, could I obtain so much as a fingerhold. How long I continued the futile search I do not know, in concentration of effort losing all sense of time; but utterly exhausted and with arms and fingers quite numb I was finally compelled to lower myself into Underhill's arms and admit myself beaten.

We retreated to our snow-corner in the chimney, and here, after a council of war, decided that now if ever the use of pitons was justified. Returning to the right wall, Underhill drove in a first piton at the limit of his reach, and, from my shoulders, drove a second one perhaps three feet higher. A ring was snapped into each, and by means of these rings we roped ourselves to the pitons. It was now Underhill's turn to launch an offensive. He mounted to my shoulders and, using the upper ring, attempted to climb to the chockstone. But though of far greater strength than I and having a longer reach, he, too, found the absence of holds an insuperable difficulty and after a strenuous try was forced back to my shoulders for a rest. A second effort likewise ended in failure and was again followed by a shoulder-rest, but on the third he solved the problem. (In calm retrospect, after the lapse of several months, Underhill still admits that this was the hardest pitch he ever climbed.) It seemed to me that, having reached up to a good hold with his right hand and having found an awkward jam-hold high up under the chockstone with his left, he pulled himself up, then swung his right leg up sidewise to the level of his hips in an attempt to catch his foot against some irregularity on the rock face well out to the right. After several attempts finally succeeding in this, he next raised his left foot onto the upper piton, made a quick shift around to the side of the chockstone, and sprawled over upon it. The actual accomplishment was not so simple as this account would indicate, but I leave it to Underhill himself to analyze further the technique of his achievement. Had he failed, probably neither of us could have summoned strength for another attempt, and there would have been no alternative save a retreat down the difficult course we had come up, a most uninviting prospect. It was a magnificent

piece of work, the finest it has ever been my privilege to witness, and for us it meant the conquest of the north face.

After sending up the packs and axes, I myself came up—none too gracefully or swiftly, finding it necessary from the upper piton on to resort in part to a fixed rope, for my arms and hands were still somewhat paralyzed. The scene of our struggle had, I observed, become quite gory. It was a vast relief to join Underhill where he was comfortably ensconced behind the chockstone.

We were again entirely enclosed in the chimney, which above us switched left. After sixty feet more of somewhat less strenuous climbing we found ourselves beneath a second chockstone, in size and position very similar to the one which had so nearly proved our undoing. Underhill yielding the lead at this point, I straddled the chimney and, by climbing perhaps fifteen feet up the right-hand wall, was able to avoid the chockstone. We found that we had now gained the terrace which forms the *second* big step of the north face-profile.

The open climbing and the smooth, polished rock-surfaces which we encountered from here on gave a wholly different character to the remainder of the ascent. I thought longingly of the sneakers which, alas, were somewhere in Wyoming along with the rest of my equipment, but found reason to be thankful for the adhesion afforded by my rubber heels and the composition sole on my right shoe.

Continuing, we traversed left (east) a few yards to a shallow inclined trough. Ascending this we reached an unclimbable buttress but were able to swing out to the left on steep slabs, and so around it. An easy chimney rising to the right came into view, and by this we climbed to a platform on the north corner. To our delight there now came into sight far to the right the West Spur of the Grand Teton. The realization that we were actually on a level with it afforded tremendous encouragement.

It is barely possible that at this point we could have traversed right and intersected the Owen route, but we avoided this and sought a course up the remaining portion of the north face. This proved feasible since we had now attained the base of the broken and rounded summit. The smooth faces and steep chimneys of the first 400 feet proved difficult—much more so than the corresponding portion of the old route, but relatively easy as compared with what we had come up—but beyond lay only an easy

scramble of 200 feet. In this portion we unroped for the first time since starting up the glacier, nine hours before. Fifty feet below the top we came upon the old Dewey pennant which, its usefulness long past, had been ingloriously cast down from the summit by some former climber.

At 3.15 we reached the cairn. Finding a couple of flat boulders we stretched out and, relaxing after the long strain, tried to comprehend that it was all over. From the register we learned that a party of five had left the summit an hour before. Later its members told us that, having innocently supposed the north face to be safe from human molestation, they had amused themselves by rolling boulders down it! We descended by the old route to Amphitheater Lake. Here I left Underhill in his solitary little camp and continued to Jenny Lake where, the next day, he rejoined me.

A comparison of the routes on the Grand Teton, now six in number, is difficult to make, inasmuch as no one individual has yet made the acquaintance of all. Underhill is better qualified than anyone else to offer an opinion, however, inasmuch as he has climbed the peak by four routes and to an important degree is responsible for the discovery of three of these. He places the four he has done in descending order of difficulty as follows: North wall, east ridge, southeast ridge, ordinary route. His favorite route remains the east ridge, which he thinks consistently interesting, yet free from the excessive difficulty and the "objective dangers" of the north wall. As for the other routes, the new west chimney used by the German climbers undoubtedly adds considerably to the difficulty of the original route; and all who have used Exum's southwest ridge agree that it is considerably more difficult than the original route. From the available accounts it would appear to be rather less difficult than Underhill's southeast ridge.

Climbs in Mexico, 1932

Henry S. Hall, Jr.

THE train ride from Vera Cruz up to Mexico City, though hot and dusty in parts, offers much solace to the mountaineer, for there are splendid views from the car window of the snow-crowned Orizaba, seen all day long, and towards evening of the huge forms of Ixtaccihuatl and Popocatepetl, towering impressively above the high Mexican plateau. Orizaba (18,225 feet), the third highest mountain in North America, exceeded only by McKinley and Logan, is seen in clear weather from the deck of the steamer before reaching Vera Cruz. Rising almost to its full height from the coastal plan on the east, it drops 10,000 feet to the elevated plateau on the west. It is dramatically visible from the train on three sides for nearly two hundred miles of the ride, the line approaching between Esperanza and San Andres to less than fifteen miles from the summit. As we looked back at its dazzling white névé covered northwest face from San Marcos at the base of the bandit-infested Malinche, it was most beautiful in its symmetry and brilliance, scarcely dimmed by the dust blown up from the parched fields.

Mexico City lies on a flat plain 7,500 feet above sea-level, surrounded by volcanoes and volcanic remnants. There must be two or three dozen cones within fifty miles of the city ranging in height above the plateau from 100 feet to many thousands of feet and culminating in the giants, Ixtaccihuatl (17,100 feet) and Popocatepetl (17,850 feet), the latter the fifth highest summit in North America, only St. Elias coming between it and Orizaba. During March, when we were in Mexico, the weather is nearly always fine, though some cumulus clouds pile up against the higher peaks, but there is seldom rain at this season which is probably the best for mountain ascents. The rainy season comes in June and lasts through September, and it is during this period that most of the snowfall for the year occurs in the mountains. The Mexicans, who are more and more learning to enjoy their mountains, have organized under the leadership of Mr. Otis McAllister, an American, the Club Exploraciones de Mexico. This active

organization sends parties out for excursions of varying length and often has large groups of thirty or more at a time on the higher peaks. Curiously enough the ascent of "the Popo" is considered by them to be complete when the lower edge of the crater is reached, at least we were told that very few bother to go to the highest point.

After a few days to become acclimated, our party, consisting of Mr. and Mrs. Thomas D. Cabot, Mr. and Mrs. Walter A. Wood, Jr., Mrs. Hall and I, drove over to Nevado de Toluca, an ancient volcano, about eighty miles by road west of Mexico City. The road, one of the highest in Mexico, after crossing the wooded range just west of the city and passing through the town of Toluca, climbs gradually up the wooded slopes of the mountain, finally emerging above tree-line and after entering the broken-down south side of the old crater ends at the borders of a lake now filing it, at an altitude of 13,500 feet. The 1,700 feet to the summit took about two hours up rather steep scree slopes, a path of sorts being appreciated, in the thin air, for over half the distance. A few feet of rock scrambling at the top brought us out on the highest point of the long semi-circular ridge. The view was extensive where clouds did not interfere. After a leisurely hour for luncheon and photographs the descent was made easily and quickly down the loose slopes, back to the car, and we were in Mexico City again for dinner by half past seven, the whole trip having taken about eleven hours.

Three days later, on March 17, Wood, Cabot and I were joined by Mr. McAllister on a five days' trip to the readily accessible "Ixti" and "Popo." Provisions and cooking equipment were purchased the afternoon before and crampons secured from Mr. McAllister. After a two hours' drive to Amecameca, a town at the foot of the mountains, we were met by one Pablo Valerde who undertakes to outfit parties with horses and men for such trips. The horses did not at first appear very promising, nor the saddles, but the men, Indians, soon had our baggage packed and we left at noon, Valerde and ourselves mounted. Riding through the town which is in the usual Mexican state of dilapidation, and crossing some fields, we soon found the trail, sunk or worn down in places several feet below the surface of the ground and horribly dusty. Many of these trails bear evidence of long use, the nature of which was evident from the occasional donkies

or horses that passed us. They were generally well laden with firewood or other burdens and driven by Indians, invariably on foot. The trail mounted steadily and after three hours came into the pine zone at about 11,000 feet. Here we noticed many of the trees girdled. The Indians hack off the bark to use the dry pitch-filled chips for starting their camp fires. Soon the tree dies, and they may then cut it for firewood and transport it as we had seen down to the villages.

By five o'clock we were not far below tree-line which is here about 13,000 feet. After some difference of opinion with Valerde as to a suitable camp spot we chose a site near a small stream where it cascaded over a lava-flow outcrop under which there was a cave, and the horses were unpacked. Following a meal, in whose preparation we all seemed to have a share, the men built up a large fire around which they arrayed themselves for the night and we spread out our sleeping-bags on the ground under the stars.

At two in the morning we woke to find a rather threatening sky, but upon Valerde's assurance that rain was unlikely we had breakfast by the light of the fire and started off on horseback after instructing Valerde to move the outfit a few miles south to the caves of Ayoloco. Ixtaccihuatl was hidden by clouds when we dismounted, at 14,300 feet, all rather chilled, in the whirling mist, the temperature being 28° Fahrenheit. Walking briskly we soon came to the beginnings of a stone hut which the Club Exploraciones members are building near the snout of the glacier which flows down on the west side of the mountain between the "Head" and the main summit. A brief halt to adjust crampons and we were soon on the ice. Unroped, because the few crevasses are all open at this season, we moved up the easy slopes, nowhere steeper than twenty-five or thirty degrees, each at his own pace. One of the Indians accompanied us as porter and "guide," the latter function being of little importance on this mountain. His strength was our envy, as he almost ran up the ice, but his technique of running and stopping, repeated over and again, did not appeal to us.

By eight o'clock we reached the saddle on the main crest of the mountain and rested in the sun at the base of the "Head." The question of climbing the "Head" had been discussed previously but the uncertainty of the weather decided us to make

Photo R. Garcia

FINAL 1,000 FT. OF NORTH RIDGE OF IXTACCIHUATL

Photo R. Garcia

POPOCATEPETL FROM IXTACÇIHUATL

Photo R. Garcia

IXTACCIHUATL FROM AMECAMECA

directly for the summit by the easy north ridge, here pure névé and rather heavily corniced on the west side. The weather became more threatening as we advanced and our "guide" growing apprehensive of the wind and clouds advised a retreat. There seemed no reason for this and when he became very insistent, we told him to go back to camp. This he did after predicting dire consequences if we tried to go on. The only difficulty encountered was with breathing in the light air and by eleven o'clock we stood on the summit, a flat snow cap. Heavy wind-blown mist cut off all view, so we soon started across the flat summit to find the route of descent. Here occurred the unexpected. After a few minutes' walk we came to an abrupt drop. We knew from photographs that the summit is partly edged with ice cliffs, but could not be sure of the exact way past them. The wind came rather unsteadily at this time, and was shifting as we soon learned, which somewhat confused our sense of direction. After two or three more futile attempts to find the desired route, and in view of the altitude and cold wind affecting some of the party, we tried to retrace our steps to the north ridge. This attempt also proving abortive, the course was again set, this time by compass, for the south arête. To steer a compass course for a certain point, it is necessary to know where you start from, but this we couldn't accurately determine after more than an hour of roaming. The whole summit cap isn't more than half a mile in diameter. The compass advocates won out, largely by luck, I think, when we shortly came upon a way past the ice-cliffs and started down, still prevented by the mists from seeing more than the length of the rope which was being used to keep the party from becoming separated. It was rather hit or miss for the next hour. Coming to a vertical rock wall below, we swung more to the right and came down what eventually turned out to be the west face of the mountain. At about this time, when we were 2,000 feet below the summit, the clouds parted and we could re-orient ourselves for the remainder of the descent. A large moraine hundreds of feet above the present surface of the glacier, which descends on the southwest side of the mountain, soon brought us down to grass line at 14,500 feet where our Indian had already arrived with two horses. Two riding and the others walking, we were soon at the caves of Ayoloco where the night is generally spent before the ascent. Supper went well and we soon

sought out a location for our sleeping bags in the open, preferring to allow our men and whoever else would, the undisputed use of the caves.

The next day was spent in luxurious ease. It was perfect, with no clouds on the mountains. Several parties of young Mexicans came up during the day for the climb on the morrow. They seemed to carry little equipment and almost no food. We gave a loaf of bread to one rather promising looking young man, but that soon turned out to have been a mistake, when several others came over, evidently expecting further handouts. The brilliant moonlit nights here, just below tree-line at 12,500 feet, were a joy. Wood had kindly lent me his extra sleeping bag, otherwise I should have been a little cool in my ordinary light bag with night temperatures in the lower twenties.

Sunday, March 20th, dawned clear and still, snow-covered Popocatepetl being visible over a nearby intervening ridge. Off by eight o'clock, we were soon skirting the southerly slopes of "Ixti" on our horses, while Valerde watched for bulls which he didn't relish meeting. We enjoyed the splendid view down into the valley toward Amecameca and Mexico City 5,000 feet below, and up to the two great mountains, as much above. By noon we had come to the broad pass at 12,000 feet between Ixtaccihuatl and Popocatepetl which Cortes crossed from the east in 1519 on his remarkable march of conquest to Mexico City. After stopping at the only spring in miles for luncheon (for water is scarce at that time of year), we continued to Tlamacas, and camped near the site of a former sulphur refinery in the woods on the north side of "Popo" at about 12,600 feet. As the sun set on "Ixti," twelve miles to the north of us, we prepared to start that night for the ascent of "Popo."

Up at 11 P.M. in the brilliant light of a full moon, we ate lightly and left camp at exactly midnight. The way lay at first through the woods, across a deep barranca or gully sixty feet deep eroded in the soft ash by melted snow waters from the mountain, and then on to the great gray ash slopes. A west wind was forming cloud banks around the west side of the mountain, but these conveniently dissipated before reaching us. The cool of the night greatly lessened the monotony of the trudge up those long even slopes. An occasional barometer reading showed that we really were getting up. At about 16,000 feet the slope suddenly

Photo R. Garcia

POPOCATEPETL FROM HIGH SLOPES OF IXTACCIHUATL

Photo R. Garcia

POPOCATEPETL

In foreground is the pass which Cortes crossed. Author's camp was at tree-line in center. Route swings left to left sky-line above clouds, thence along sky-line to crater and along edge on this side to summit at right

became very hard where melting water from the snow had frozen over and among the ash. Crampons were used from this point and became very helpful as we arrived at the weird *nieve penitente* formation. The snow instead of presenting a fairly hard smooth surface, as it had on the corresponding side of "Ixti," was here melted, or probably rather evaporated, into sharp pinnacles and gullies from a few inches to several feet in relief. As the first light of dawn showed to the east, the cold perceptibly increased and with it came a biting wind. The party was now going as each man pleased and we became somewhat strung out as the altitude of nearly 17,000 feet began to have its effect. Mexico City to the northwest and Puebla to the east were clearly visible, each a myriad of lights. The landscape below and the few clouds which continually blew in lower down from the west were still bathed in the brilliant silver light of the moon, as the east became solid gold, silhouetting the mighty Orizaba, eighty miles away on the horizon, and the nearer Malinche. Finally at five-thirty just as we reached the crater edge the sun rose directly over the summit of Orizaba. Waiting for the others to come up, we looked at the thermometer which registered fifteen degrees. The barometer showed an altitude of 17,100 feet. This was as far as Mr. McAllister had ever been on the mountain. To be sure, one had a splendid view, and the crater was very awe-inspiring with its vertical sides, in places over a thousand feet deep. Steam issued from several vents with an audible roar, and the vile rotten-egg smell of sulphur at times filled the air.

When all had rested, it was unanimously decided to go on to the top. This we did in about an hour and a half by skirting the north edge of the crater. As the sun rose, the wind dropped. It became much warmer, noticeably increasing the effects of altitude on one or two members of the party. The last few hundred feet went very slowly. The highest point on the west rim of the crater is apparently about 17,850 feet above sea-level. The Mexican Government, we later learned, has no accurate determination of this figure. The view was very extensive in all directions. Eighty miles to the west stood the bulky Nevado de Toluca and more to the southwest, very much farther away in the blue distance, was a range which McAllister thought might be the Sierra Madre del Sur near the Pacific Coast.

In foreground is the pass which Cortes crossed. Author's camp was at tree-line in center. Route swings left to left sky-line above clouds, thence along sky line to crater and along edge on this side to summit at right

After more than an hour of enjoyable rest we looked at Mexico City and decided to try to get back there in time for dinner. The descent to camp took about two hours. There a slight interruption might have occurred when we found some rather doubtful looking characters, about fifteen in number, all armed with rifles of ancient vintage, in complete possession. McAllister talked with them and when he had disappointed them with the report that we had no money with us and Wood, mumbling audibly that he should be picked on, had given them cigarettes, they quietly moved off into the woods, much to our relief.

Packing up we set out for Amecameca about noon, which place we reached in four hours, over what must be, I am sure, one of the world's dustiest trails. Here a private automobile was luckily secured, the bus being hopelessly crowded without us and baggage, and we reached our hotel, dirty but well pleased with the trip, in good time for dinner.

This brought our climbing to an end, too soon, as I had hoped to do Orizaba before leaving Mexico. Had I joined a party of the Club Exploraciones two days later I should have had that climb also. It is said to be somewhat more arduous than either "Ixti" or "Popo." The train is taken to San Andres, thence a tram to Chalchicomula and a walk or ride of four or five hours to the camping place for the night, all of which can be done the first day. The climb of about eight hours up and four down is done the second day and return to Mexico City on the third day. There had been talk when we first reached Mexico City of a party to try a new route from the north but this was abandoned owing to reported bandit activities in that direction. Such a complication is always possible in Mexico, but seldom results seriously for tourists who have taken the precaution to leave their valuables behind.

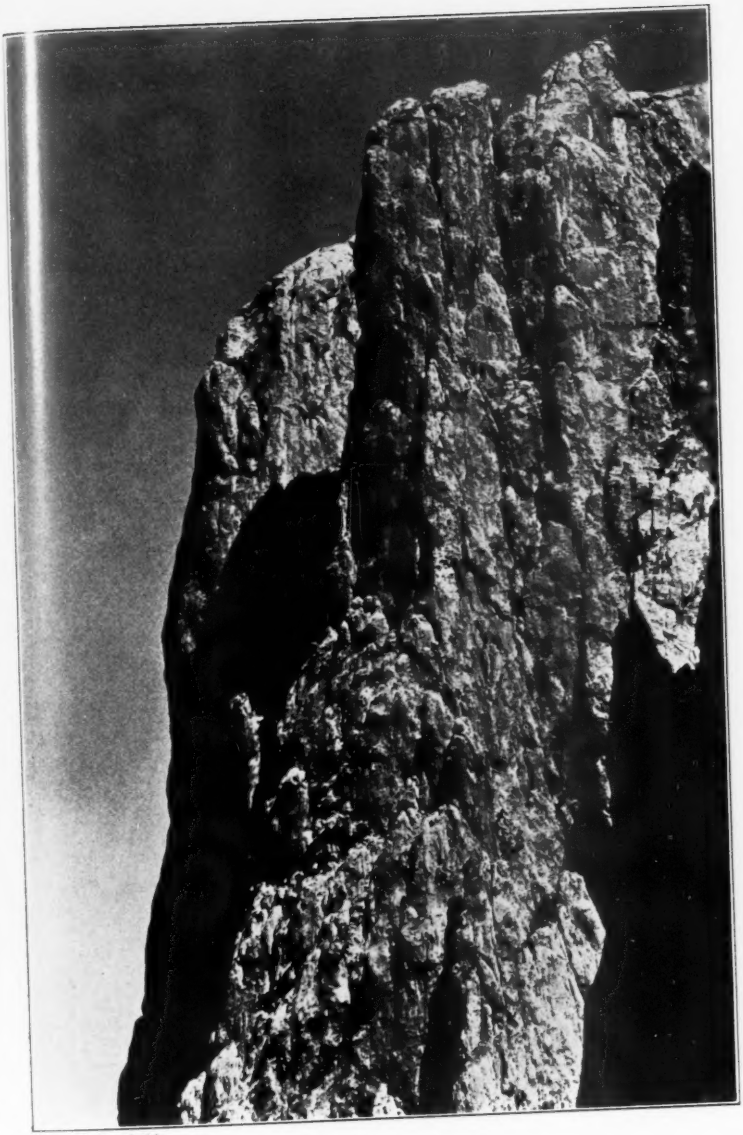


Photo G. Berthold

THE PRAEDIGTSTUHL

The Fiechtl-Weinberger route runs up the sky-line on the left

But what makes that range of mountains particularly interesting, I think, is the fact that it seems to offer a particular kind of rock and of climbing that fits one to accomplish the most, not only in any other kind of rock-work, but even in any other sort of mountaineering, including ice-work.

Strange as it may seem, one of the reasons for this probably lies in the very thing which is most often held against "Kaiser" climbing: the use of artificial aid as an "assurance" and as a means of advance. A good climber, of course, will avoid any movement endangering the stability of his position on the rock. However, in passages of extreme difficulty, some risk always exists, and a "piton" gives a certain guarantee and feeling of safety, without which he could not go to the limit of his physical possibilities. If I wished to compare climbing to the feats of circus acrobats I could say that the "piton" corresponds to their net. As a means of getting farther where it would not otherwise be possible, the artificial aid also opens up rock faces with passages of extreme difficulty which would not be known otherwise.

Another reason for the "didactic" value of climbing in the Kaiser lies in the formation and nature of the rock itself. It can be classified somewhere between Dolomite rock and Mont Blanc granite, and contains elements of both. It has even some things in common with the very exceptional sandstone climbing of the "Sächsische Schweiz" south of Dresden. One finds in the Kaiser every kind of outside face climbing, of chimney and crack climbing, and of most kinds of "friction" climbing. But one peculiar and very typical formation is common—a series of small vertical ribs rather thickly placed beside one another, which are often not sharp enough towards the outside to be solidly held by the hands, nor towards the inside to solidly hold the feet. Yet they permit one to lean the back sideways against the most protruding ones and to place the feet at a convenient distance, against a neighboring one, as if one side of the body were in a chimney and working its way up with chimney technique. There are numerous places of this sort, of an easier kind in the famous east face of the Fleischbank, and of the most difficult kind in the southeast face of the Fleischbank and in the Foechtl-Weinberger route on the Praedigstuhl. Sometimes, as in the two last climbs, there is no one way of getting up, but only combined and continuous move-

Photo G. Berthold

THE TOTENKIRCHEL AND THE WEST FACE

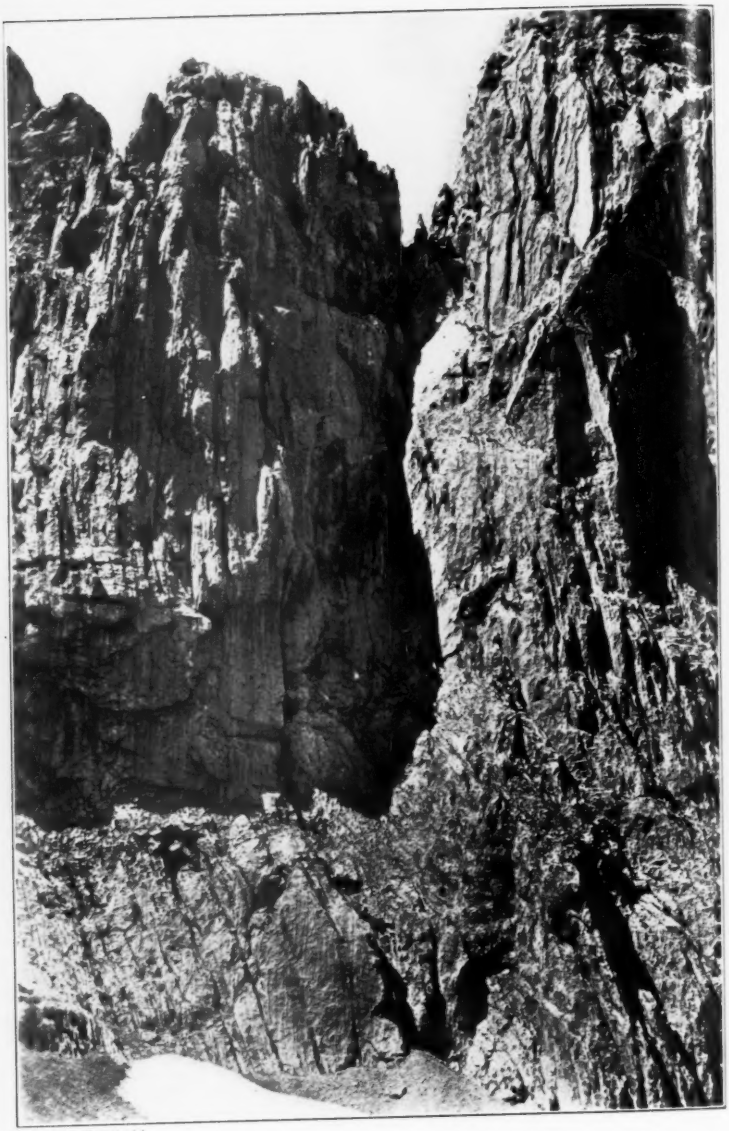


Photo G. Berthold

THE SOUTHEAST FACE OF THE FLEISCHBANK

(In sun on right)

ments—a most subtle compromise, as one might call it, between every kind of technique.

The last reason, for the value of the Kaisergebirge, lies in the fact that one can do, and observe being done, every kind of climb. The Totenkirchel alone has as many as sixty distinct routes, which makes it, of course, almost unique among the mountains of the world. They are so dissimilar and present such diverse features of interest, that one often has the impression of being on a totally different mountain and climbing by the only possible route. The sight of human beings and the sound of human voices in places which seem to be meant by nature to be absolute solitudes, may sometimes annoy one, but after all the beauty and grandeur remain unchanged.

The proper employment of the "artificial means" themselves, involves a technique of its own and is not easy to acquire. The work tends to improve one's sense of balance and to impart an increased skill in the handling of ropes. The classical maneuver which made the "direct west face" of the Totenkirchel and the east face of the Fleischbank famous, is the *Seiltraverse* or "traversing on the double rope"—a roping sideways instead of down. Just as in climbing of extreme difficulty, two ropes are required. It is essential, in order to avoid complications, that they be easily distinguishable from each other. One of the ropes is fixed through a "piton" in the usual manner for roping down with a double rope, and one puts one's self in the normal roping-down position. But, instead of letting oneself go down and pushing oneself away from the rock with the feet, one keeps close to the rock and pushes up against one side with the feet. This allows, as a help, the use of what one might call vertical foot-holds and hand-holds, and allows one to get across remarkably smooth rock faces with the slightest amount of friction. To avoid the danger of suddenly swinging around in too wide an arc, one usually places "pitons" at rather close intervals, and one must always have a "mousqueton" ("Karabine") ready in one's hand. There does not seem to be any logical reason for anyone who practices roping down to condemn the "double rope traverse" as a help of too artificial a nature.

I think it would be hard, in fact impossible, to find a region where more pleasure can be gotten out of rock-climbing, or where there is more opportunity to exercise and to learn. For a climber

already experienced in the Dolomites, or the aiguilles of Chamonix, who adapts himself easily to new kinds of ground and to new methods, I would suggest the following progressive series of climbs:

Totenkirchel-Heroldweg, or Suedostgrat, descent: Leuchs-variante.
Praedigtstuhl-Westschlucht, descent: Potzangkamin.
Praedigtstuhl-Nordkante, traverse to Suedgipfel, normal descent.
Totenkirchel-Klammerkamin, descent: Fuehrerkamin.
Totenkirchel-Piazwand, usual descent.
Fleischbank-Ostwand, descent: Fuehrerweg.
Totenkrichel-Schneiderweg, usual descent.
Totenkirchel-Westwand, usual descent.

If all goes well, and he has a companion with whom all goes equally well, he can try the Leuchsturm-Suedwand, the Dölfer-U, the Fiechtl-U and begin some of the "extreme climbs."

The best guide book is the *Fuehrer durch das Kaisergebirge* of Leuchs, although it does not contain the latest ascents, and the old scale of five degrees of difficulty is still used. Good information is available about the various routes on the spot.

For additional particulars concerning climbing in the Kaisergebirge consult *A. J.* xxxvii, pp. 279-300.—*Ed.*

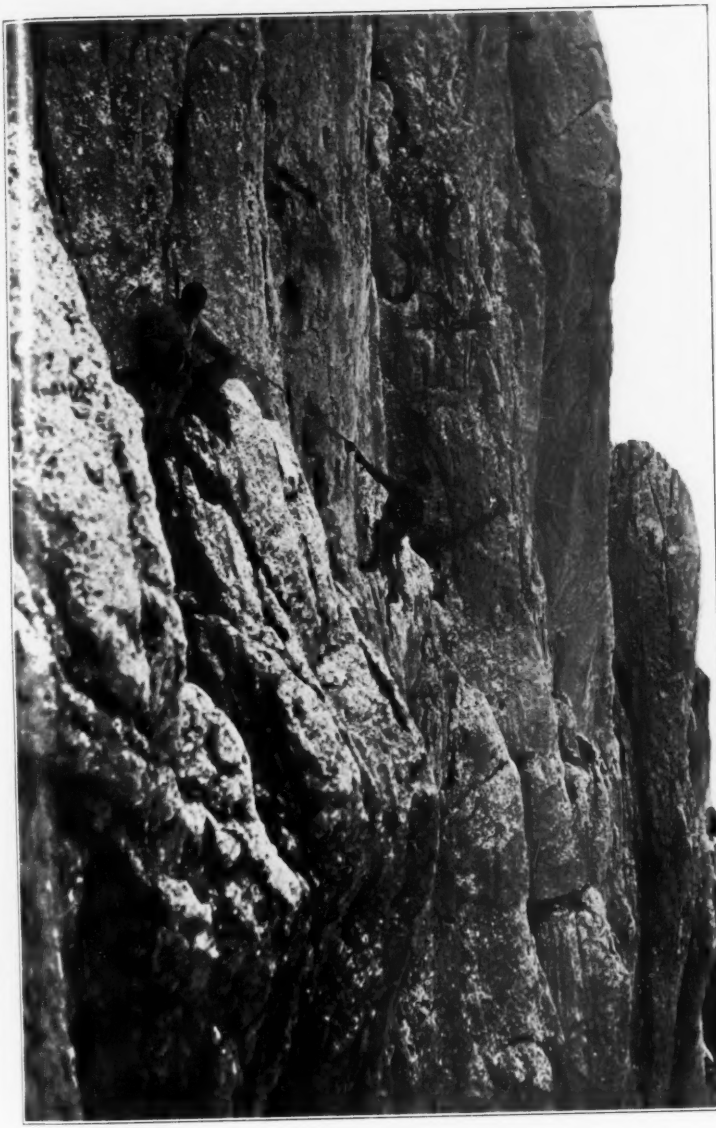


Photo G. Berthold

ENTRANCE TO THE KLAMMER CHIMNEY, TOTENKIRCHEL

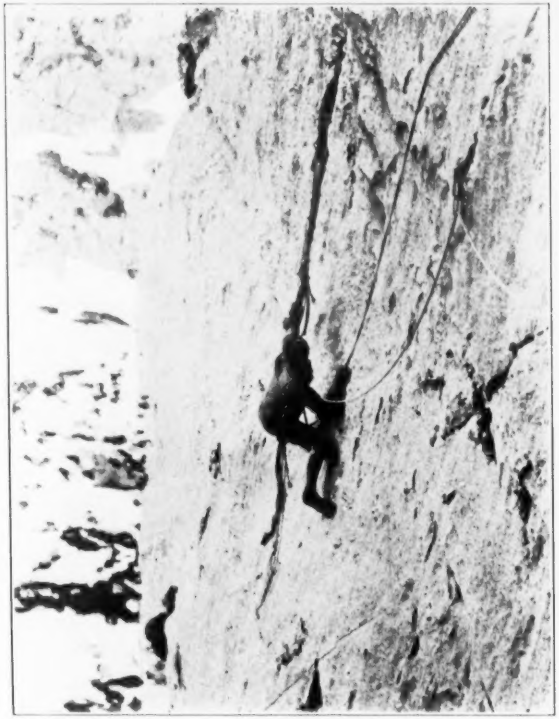


Photo K. Herron

In the Middle

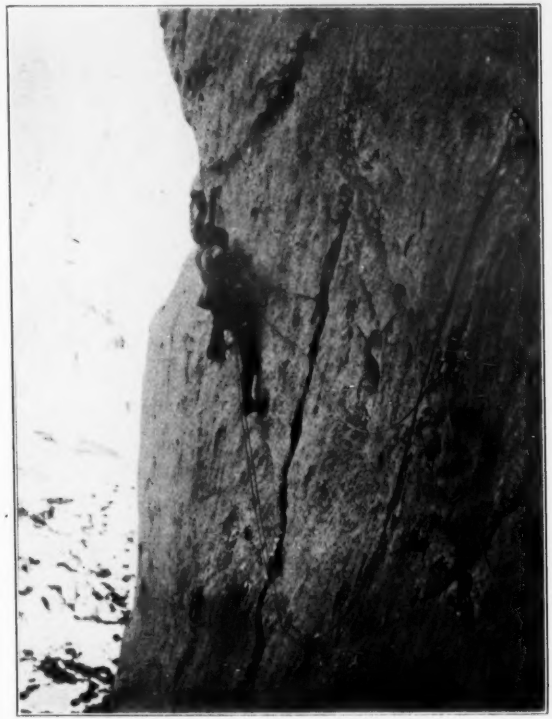


Photo K. Herron

At the End

BIG DOUBLE ROPE TRAVERSE, WEST FACE OF THE TOTENKIRCHEL

To the Peaks of Elzivir

J. Monroe Thorington

"I love to lose myself in other men's minds. When I am not walking, I am reading; I cannot sit and think. Books think for me."

—Charles Lamb.

LIKE the Alpines of Tarascon my bookshelves are neither very difficult nor very high, but imagination has supplied them with fabulous names, such as "Le Pic-des-Elziviers" or "Le Mont-Froschouer à Zürich." The books which fill them are like the pebbles and stones that one brings back from mountain tops; perhaps they are the mountains themselves, or even men; for books once were men.

In any event, they afford a pleasant form of winter mountaineering (indeed, to the chagrin of folk more gregariously sociable, it can be indulged in during other seasons of the year), requiring none of the "double-muscles" of Tartarin, little skill, and no innate qualification save that of enthusiasm. The latter, on occasion, must be politely but firmly repressed, for the technique of provenance, privately printed edition and uncut copy, is at first terrifying to the innocent bystander. It is only after much experience that one knows what a pleasant game it is for cabbage-rabbits—who stay at home and have an extraordinary horror of fatigue and draughts.

Against all modern rules of cataloguing, chronological arrangement of books on a shelf has its advantages. It brings good fellows together again who lived and wrote in the knowledge of their own days; and, in passing along the volumes, one sees more clearly the evolution resulting through the passage of time. The size of books also enters into arrangement; duodecimos do nicely on upper shelves and are less likely to produce catastrophic avalanches, while stout folios are best placed near the ground, where they may tumble against each other in friendly groups like aldermen after an all-night spree.

That is why I have put Sebastian Münster, Johann Stumpf and Athanasius Kircher together on the lowest shelf; I like to look at them often and to have them within reach. Münster, who wrote the Basle Ptolemy, produced his *Cosmographia Universalis*

in 1543. My copy, from an ancient monastery, has clasps of brass, and borders of saints stamped on the pigskin-covered boards. It was printed by Heinrich Petrus, who used the border designs of Holbein for the title-page and the maps. There is a world map, with ships and sea monsters and cherubic blowers-of-winds, and a map of the New World, with Yucatan as an island, and a cannibal hut in Brazil with an appetizing leg, hung like a Christmas stocking on a leafy branch. The first woodcut of the text shows the Creator, resting on the Seventh Day on a cloud between the sun and the moon, looking down at the new earth, with birds and bears and stags and fishes, and seeing that it was good.

What a fairy-tale life those men lived. The map of Switzerland is oriented to the west, and is described as *modern!* There is a bear softly footing it through the Frutingen valley, and chamois are bounding on the peaks between Brigue and the Furka. On the Septimer pass a man with bow and arrow is shooting a fearful black beast. The map of the Valais is oriented toward the east, and a fat chamois guards the mountain-tops between the St. Théodule and Simplon passes. On the pages that follow are woodcuts of the alpine animals: a giant ibex; slender, high-stepping chamois; and a sedate marmot. Further on, before the mirror-drawing of Lucerne, William Tell points his crossbow nonchalantly at a chubby boy who balances an apple on his head—a feat which always impresses me as being the most adroit part of the performance. Did you ever try to balance an apple on your head?

Stumpf was the foremost authority on the history of Switzerland until the beginning of the eighteenth century, his *Chronick* appearing in Zürich, in 1548. Early in the book one finds a quaint cordiform map of the world, and many battle scenes with cavalry charges and forests of spears. The map of Switzerland is oriented toward the south and a fleet of ships sails majestically up the lake of Geneva. The main range of the Alps crosses the top of the map, and names of the passes are inscribed on flourished scrolls. Animals of the Alps are depicted in an extensive series, among them two dragons, the text informing us that even snow-covered mountains have sun-warmed caves on the south side, where such monsters may bask in all the heat of India.

Most exciting of all is the picture of an avalanche, the snowball with embedded trees knocking down horses and riders. So delicately may the snow be balanced, says the author, that it may be set in motion by an echo, or the passage of a bird. This woodcut appears to have been copied from Hans Burgkmair's drawing for *Theuerdank,* which appeared in Augsburg in 1517, its tradition being carried over into the illustration in David Herrliberger's *Topographie der Eydgnossenschaft* (1754-73), and made more graphic by a whirling ball of snow, houses and cattle falling upon a peaceful village in the valley.

The *Mundus Subterraneus* of the Jesuit, Kircher, is interesting not only because it contains a chapter on the Alps and is the first physical geography, but also on account of huge plates, showing eruptions of Vesuvius and Etna; and the Mountains of the Moon, oriented to the south and with fearsome crocodiles swimming in the sources of the Nile. Francis Edwards once sold a copy of the first edition (Amsterdam, 1665) completely colored by hand and heightened with gold.

My copy of Matthew Merian's *Topgraphia Helvetiae* belonged to Daniel Burckhardt, of Basle, who, on November 1, 1769, painted a fine crest on the flyleaf. The book had then been in existence for 127 years and contains the earliest picture of a glacier, the lower Grindelwald. Glaciers were things to be feared in those days, but this scene is comparatively accurate except for the accompanying legend, which presents the novel theory that the ice grows out of the ground! One may spend pleasant hours with such a book, filled as it is with fascinating pictures of towns and costumes.

While I have not a complete copy of *Theuerdank,* I am the proud possessor of ten leaves from the first edition of 1517. They are framed in double glass and hang beside Lucas van Leyden's forceful portrait of Emperor Maximilian. Thus one may see at a glance the black-letter of the Augsburg press, with all its splendid flourishes, as well as the woodcuts with their thrilling depiction of climbing and hunting adventure.

Conrad Gesner's *De montium admiratione* still lies beyond the horizon, but pride of my lower shelf are the three folios of his *Historiae Animalium,* which the Froschouer press of Zürich brought out in 1551-58, nearly twenty years before they published Josias Simler's classic *Vallesiae Descriptio.* All of the pictures,

including the initial letters, are hand-colored. A whole chapter is devoted to the chamois and the legends about this animal. The last plate in the first volume shows the Creation, in the Garden of Eden: the sun and the moon are in the same sky; God brings forth a patient Eve from the side of a pained Adam, while the birds and beasts, including the unicorn, are grouped about in a wondering circle. Volume two contains a portrait of Gesner himself, who died of the plague in his fiftieth year. The title-pages show a naked cherub riding a great green frog under a spreading tree, the mark of this famous press of the sixteenth century.

It was the Elzivirs who began the trouble on my top shelf and have done untold damage to my exchequer. The Leyden press which first originated the duodecimo habit could not have foreseen what collectors would be let in for. The *Helvetiorum Respublica* stands beside Simler's *Vallesiae et Alpium Descriptio*, together with Fortunatus Sprecher's *Rhetia* and Lambert vander Burch's *Sabaudiae Respublica et Historia*. All of these are in vermilion morocco with the bookplates of the Syston Park collection,[1] and I like them so well that I have placed behind them the same volumes in original bindings. But these are by no means the earliest books.

Among the small volumes is an early vellum-bound copy of *Descriptio de Situ Helvetiae*, by Heinrich Loriti of Glarus, a man who was one of the first to apply scientific principles to the construction of globes. In the Basle edition of 1554 (it was first printed in 1515), this is a Latin poem in hexameters, illustrated with the quaintest pictures of Swiss cities, with mountain backgrounds, that one can imagine. Now Loriti was the tutor of a young man named Aegidius Tschudi, also of Glarus, who wrote a description of his travels in Switzerland about 1528. Some years later he loaned the manuscript to Loriti who, in turn, showed it to Sebastian Münster. Münster promptly borrowed it, rushed back to Basle and printed a German and a Latin edition without so much as asking permission of the author. But for Münster, however, this earliest Swiss topographical work, *De prisca et vera Alpina Rhaetia*, might never have been published. My copy of the

[1] Begun about 1785 by Sir John Thorold (1734-1815), a collector of Elzivirs, and continued by his son, Sir John Hayford Thorold (1773-1831). The collection was sold in 1884, most of it being acquired by Quaritch.

Latin edition (Basiliae, apud Mich. Isingrinium MDXXXVIII) is a beautiful piece of printing, with little initial letters, depicting gnomes and animals, indenting the paragraphs.

Next to these is Johann Leopold Cysat's *Beschreibung des Luzernersees,* printed in Lucerne in 1661 and containing plates of dragons which surely added to the inspiration of Dr. Scheuchzer. Then comes Marc Lescarbot's *Tableau de la Suisse,* which Adrien Perier printed in Paris, at the Golden Compass, in 1618, in which the whole history of Switzerland and the Alps—with an appreciation of glaciers—is summed up in a lengthy poem. My copy was sold as a duplicate by the British Museum in 1787, the year in which de Saussure ascended Mont Blanc.

This brings us to Simler, whose *Vallesiae Descriptio* of 1574 has been described elsewhere.[2] I have placed the armorial binding of De Thou beside another copy from the Froschouer press in its original vellum. Then there are two copies of his *Republique de Suisse,* newly translated into French, one edition printed by Jacques du Puys in Paris, 1578, containing the same views of Swiss cities as Loriti's book.

My copy of Dr. J. J. Wagner's *Mercurius Helveticus* is in the third (duodecimo) edition of 1701. When it first appeared in 1684 it was the first real Swiss guidebook, and contains charming engravings after Merian. An early book describing the routes across the Splügen, Simplon and Mont Cenis passes is *The Voyage of Italy,* printed both in London and Paris in 1670, written by Richard Lassels, "Gent, who Travelled through Italy Five times as Tutor to several of the English Nobility and Gentry." "It was toward the very beginning of October," he tells us, "when we passed that way (the Simplon), and therefore found that Hill in a good humour; otherwise it is froward enough. Haueing in one Houres time crawled up the steep of the Hill, we had two houres more rideing to the *Village* and *Inn of Sampion:* where arriueing, we found little meat for our great stomacks, and cold comfort for all the hot stincking *Stoue.*" Of another route (Aiguebelette) he writes, "This is a pretty breathing hill, and may be called the *Alps foule ouer,* or the *Alpes* in a *running hand* and not in that fair *Text hand* which I found the *Mont Cenis* to be in. It hath all the lineaments and shapes of the great *Alpes,*

[2] *Sierra,* xvii, 33; *A. J.,* xl, 141.

that is, much winding and turning; deep precipices, Marons, or men with little open chairs, to carry you up and down the hill for a crowne; and much stumbling worke. In fine this hill resembles Mont Cenis, as a proper man may do a Gyant."

Finally, my 1610 edition of *Les Voyages du Seigneur Villamont,* published by Jacques Besogne, rue aux juifs, près le Palais, Rouen, contains the author's account of his ascent of the Roche Melon, near Susa, which the knight, Rotario, climbed in 1358. Villamont was there in the summer of 1588, guided by two *marons* who carried provisions for two days and told him that the mountain was almost four leagues in height. He used climbing irons on his hands as well as on his feet, but rejoiced at the view of Piedmont and Lombardy, hurrying down to Novalese and the city of Susa the sooner to enjoy their delights.

Villamont was followed in 1608 by the first English traveler to visit the Roche Melon: Thomas Coryate, whose *Crudities Hastily Gobled Up* was for many years the only handbook for continental travel. It was so read to pieces that only a few perfect copies of the 1611 edition are known. The plates of the coy author with the Venetian courtesan, and the Strasburg clock are often missing; and the collector may well be content with the reprint of 1776, containing the account of this Odcombian Legstretcher's death in India.

The portrait of Gilbert Burnet, Bishop of Salisbury, framed with an autograph letter, has been smiling down from my wall this many a long day. His bookplate is in the first edition of his *Letters containing an Account of What seemed most Remarkable in Switzerland,* but it was I who put it there. The first edition was published in Rotterdam, in 1686, with a second issue the same year at Amsterdam. The second edition and a French translation were brought out in 1687, none of them in England as, at the time, he was a partisan of the Prince of Orange. The Bishop is remembered by mountaineers on account of an uncomplimentary reference (not original with him) to Mont Blanc: "One hill not far from Geneva, called Maudit or Cursed, of which one third is always covered with Snow, is 2 miles of perpendicular height, according to the observations of the incomparable Mathematician and Philosopher Nicolas Fatio Duiler, who at 22 years of age is already one of the greatest men of his age, and seems to be born to carry learning some sises beyond

what it has yet attained." Burnet's son, William (by his second wife), was Governor of Massachusetts, 1728-29, and in 1701 had visited the Grindelwald glaciers. His descriptive letter to Sir Hans Sloane appeared in the hundredth number of the *Philosophical Transactions* of the Royal Society, with the earliest published view after Merian's.

The eighteenth century ushered in even more important books. In 1714 the famous London press of Jacob Tonson published anonymously *An Account of Switzerland,* now known to have been written by Abraham Stanyan, who had been Lord of the Admiralty and was then envoy to the Swiss cantons. Samuel Johnson praised the work, which is one of the best ever written by an Englishman on Swiss political matters. Two French translations appeared in the same year, but the author's name never occurs on the title-page. My copy has the fine armorial bookplate of Dacre.

In 1708, at the Sign of the Falcate Moon in St. Paul's Churchyard, London, Henry Clements brought out the *Itinera Alpina* of John Jacob Scheuchzer, who dedicated it to Isaac Newton. Peter vander Aa, of Leyden, in 1723 published the enlarged work in two volumes, covering the doctor's journeys during the years 1702-11. My copy once belonged to Samuel Wegg, Esqr., who later became Governer of the Hudson's Bay Company, and contains the amusing plates of dragons and the glaciers of Grindelwald. Scheuchzer, one suspects, did not want to believe in dragons, but the evidence of their existence was too much for him. There were the pictures in the books of Cysat and Wagner; the dragon "stone" in the Lucerne museum, known as a universal panacea for everything from stitch-in-the-side to plague; and, finally, attestations from all over Switzerland by members of the clergy and other trustworthy souls who had actually seen the monsters. Many of the plates in Scheuchzer's work were contributed by prominent fellows of the Royal Society, and their names are engraved upon them, but Dr. Scheuchzer was skeptic enough to play safe and consequently all of the dragon-plates are anonymous.

Beside Scheuchzer's books I place Georg Altmann's *Beschreibung der Helvetischen Eisbergen,* with the little copper-plate of the Lauterbrunnen valley on its title-page; and Gottlieb Siegmund Gruner's *Histoire Naturelle des Glacieres de Suisse,* for which

Aberli sketched the frontispiece. This edition is Keralio's translation (the German edition still eludes me), sold by Pancoucke, in the rue Poitevins, à l'hotel de Thou, Paris, in 1770.

The coming of Pococke and Windham to Chamonix in 1741 drew the attention of the scientific world to the wonders of that valley. Although, according to C. E. Mathews, Peter Martel's account is very rare, I have had no less than four copies. Two of these I have kept: one because its cover is of saffron damask embroidered with many crimson fleur-de-lys; the other because it was a gift to Elizabeth Astley from Sir Edward Astley, who bound it with Lady Mary Wortley Montagu's *Six Town Eclogues* (with the correct names of the scandalous characters added in manuscript), and other pamphlets. One never tires of the *Account of the Glacieres or Ice Alps in Savoy,* with Mr. Price's lurid sketch of the Dru and Martel's charming drawing of boquetin, chamois and marmot.

The great days of the Mont Blanc adventure were approaching, with Marc-Théodore Bourrit as unoffieial historian. In 1773 his *Description des Glacieres* was published at Geneva, my copy containing a neat table of elevations in the author's own hand, dated May 25, 1774. C. and F. Davy translated it into English under the title of *Relation of a Journey to the Glaciers in the Dutchy of Savoy.* In my large-paper copy of the 1775 edition (Norwich), Samuel Johnson's name is listed among the subscribers.

The first volume of Saussure's famous *Voyages dans les Alpes* appeared at Neuchatel in 1779. When young Frederick Augustus Eschen fell into a crevasse and was killed on the Buet in the summer of 1800, the third volume of the work was found in his pocket. One may well wonder whether this was the quarto edition, and collectors have pointed out that this may be but poetic justice, the penalty of carrying a heavy book on a mountain.

Luck plays a certain part in book-hunting. Classical philology has never enticed me into long excursions, although I once purchased a copy of Strabo's *Geography* (the Paris folio of 1620, with armorial title-page, and Greek and Latin text in parallel columns), in order to read book iv (with the aid of an excellent translation) which deals with the Alps. It was pleasant to find the backstrip strengthened by a large slice of an Elizabethan manuscript on parchment.

Then there was the skeptic who doubted my assertion that certain books were hard to find, and who, with a triumphant look in his eyes, at the end of twenty-four hours handed me the 1821 Baltimore imprint of Howard's *Narrative of an Ascent to the Summit of Mont Blanc,* quite refusing to tell me where he had obtained it, except to assure me that it had not been stolen!

There was my own good fortune in securing Mrs. Beaufoy's diary of her Oberland tour in 1787, after it had been on a dealer's shelf, completely catalogued, for three months. I once found Bourrit's rare pamphlet *Lettre a Miss Craven* (1787), and also a ticket of admission to Albert Smith's "Mont Blanc," used as markers in other volumes. Sometimes good things get away, as did the original watercolors and the certificates of the Hawes-Fellows ascent of Mont Blanc, which were recently sold in London. I trust that the present owner will not discover how closely I have since watched for his obituary!

Occasionally long journeys lead to books, as did my search of several years to the discovery of the Howard manuscripts in Virginia. Sometimes books take one on extensive wanderings, as did my copy of Josef Walcher's *Nachrichte von den Eisbergen in Tyrol,* with its eighteenth century engravings of the lakes of Rofen and Gurgl, which lured me to the glaciers of the Oetzthal.

If you have followed me thus far, you will realize that I have only been attempting to arouse what every keen collector hopes to see in the eyes of the visitor, a light of murder and robbery. But if, in addition, there be a gleam of sympathy, you will join with me in the inviting shout of old John Fletcher—*Lights here, for my study!*

Long Ago on Mount Cook

CONRAD KAIN

THE climbing season in New Zealand is from November to April. Mt. Cook (12,349 feet), in the Southern Alps, has the reputation of making its own weather. In the season 1915-16 I made four attempts to climb the mountain, and on these fruitless expeditions I gathered first-hand information on this matter. There is no mystery in the evil reputation the mountain has; it is simply based on natural laws of precipitation and evaporation. Mt. Cook towers about 1,000 feet above its neighbors, and is located near the main divide. The precipitation on the western slopes of the Southern Alps is extreme when compared with that on the western slopes of North America.

On January 29, 1916, I made the fifth attempt with Mrs. J. Thompson, of Wellington.[1] We left the Hermitage at noon for the Hooker hut (3,770 feet), situated on the south bank of the glacier and six miles distant. The Hooker glacier is about six miles long, its terminal face (2,880 feet) three miles from the Hermitage. Harper Saddle (8,580 feet) is at its head. This is the steepest of the four large glaciers east of the divide. For nearly four miles the ice is covered with débris, but a mile and a half from the hut the moraine, over which the trail leads, breaks up and clear ice and snow begin.

Above the icefalls the glacier widens out into snowfields which sweep down from the lower and middle summits of Mt. Cook. From the high summit a buttress leads down to an isolated rock at its foot, known as the "bivouac." The real climb of Mt. Cook begins here, the camp site (7,500 feet) being the highest in the Southern Alps. The view and the surroundings are alpine in the full sense.

Next day, at noon, we arrived at the bivouac, being welcomed by Mr. Samuel Turner and his porter. The late Mr. Turner was internationally known, both as a climber and a writer on mountaineering. His literary productions were much criticized by

[1] "A marvellous feat unequalled for daring in the annals of the Southern Alps," *A. J.*, xxxix, 275.—*Ed.*

other writers; but he and I spent many days together and, although we could not always agree on matters pertaining to climbing, I found him to be a good companion, with many fine qualities. He was, in my opinion, a fair climber and no shirker of hardships, being always willing to assist a guide by taking turn as leader. I enjoyed his company more than reading his books. Of other authors I have met and whose works I read with great delight, some have been poor comrades when on a mountain.

There are three routes[2] from the bivouac: Green's couloir, which I believe was followed only once, in descent. This is not a practical route because of stonefalls and avalanches. Earle's route is the second, while the third leads over the lower and middle peaks, and is referred to as the "Grand Traverse."

Mr. Turner came to the bivouac with the intention of conquering Mt. Cook alone and had chosen the Earle route, while we decided on the "Grand Traverse." To lighten the work for the long climb, I tramped over the plateau of the Empress Glacier. A rock spur running down from the lower peak attracted me as the best way up, and I made good progress for about two hours before being forced to the slope between the lower and middle peaks. I had cut a number of steps and could see some distance ahead. Satisfied that I had done enough I returned to the bivouac where I found supper waiting. Mr. Turner entertained us with balancing tricks, beginning with a sheet of notepaper on his nose and finishing by supporting a rock weighing about fifty pounds on his chin. It was a very pleasant evening.

Frost and wind were absent, a very rare occurrence at such an elevation, and it proved to be the only one of the many nights I spent here through which I slept comfortably. Next morning, at 3.45, we started our day's work. The porter stayed in the bivouac, his duty being merely to keep an eye on Mr. Turner. In three hours we came to the end of the broken trail, but during the night a great change had taken place on the slopes above, an avalanche having swept away the bridge over the bergschrund, on the route I had planned, and we lost time in looking for a place to cross. Finally I managed to overcome the obstacle and cut steps on the slope above.

[2] For these routes see *A. J.*, xxxix, illustration p. 277.

Then we struck better ground where the going was good, but there was danger in sight. I had just finished explaining to Mrs. Thompson that this was not a place to linger, when we heard the reports of falling stones. "There she comes, follow quick," I shouted. We made a dash for an enormous ice block a few feet from us; it was a race with death. Fortunately our shelter withstood the impact of the avalanche and only fine snow rolled in on our feet and buried the rope. A third climber on the rope would have been disastrous on that occasion.

As the close call did not upset Mrs. Thompson's nerves, we continued the ascent by rounding a few large crevasses and snow walls, and gained safer going on a small plateau. We reached the main ridge a short distance from the lower peak, from which it appeared a long way to the middle peak, the length of snow ridges being nearly always overestimated. We left the lower summit at eleven o'clock and encountered no difficulty worth mentioning; one hour later we reached the middle peak, wet with perspiration. I have no recollection of such an intense heat wave on a mountain as we had that day.

The view was magnificent, the most striking sight being the ridge up to the highest point. Mrs. Thompson made some remarks about the steepness, but I assured her that it would not be so terrible when she got nearer. On some occasions, motherly words from the guide on a climb are a good stimulant. At 12.20 we started for the forbidding ridge. Shortly afterward I spotted Mr. Turner far down on Earle's route; he heard my yodel and waved his hat. An hour later we saw him descending on a snow slope. He told me later that conditions were not favorable for a solo climb.

We made good progress along the ridge, which we found less steep than it appeared from the middle peak, and stepped on the summit a few minutes before three o'clock. It was as warm and calm as on a tropical sea beach. Mrs. Thompson was delighted to gain the highest point of her native land. Ladies, as a rule, do not tell their age, especially to males; therefore, I was surprised when she told me that she would be sixty on her next birthday and would like to celebrate the occasion on Mt. Cook.

We climbed more than a dozen peaks together, some of them long tiresome snow tramps, and some more difficult. Our most exciting adventure was cutting the cornice on Mt. Burns, but she

never played out or showed fear. It was in the early days of my career as a guide that I discovered my outstanding weakness of loafing on the summits. With this in mind I decided that three-quarters of an hour was all we could spare for the "Gipfel-rast." The snow was in fine condition, no steps were required, and in a short time we reached the rocks which are referred to as the summit rocks, on the Tasman side.

While scrambling down, my thoughts ran on Zurbriggen. From the rocks two routes branch down—Zurbriggen's to the right, and Green's (Linda Glacier) to the left. Owing to the lateness of the hour we had no choice and took the latter route. In my opinion "The Death Trap" would be a more appropriate name for this glacier, as it is the most dangerous corner of Mt. Cook. I confess that I did not feel very happy descending this glacier as it had been unusually warm and one could expect an avalanche at any moment. Added to this was the recollection that, only two years since, I had descended with a party on this route and walked over an avalanche which had killed three climbers. On the lower part of the glacier there were crevasses in uncountable numbers, and the bridges were thin and frail. After the excitement of passing through this network we enjoyed the walk over Glacier Dome, where the last reflection of the sun vanished. At 9.40 P.M. we arrived at the Haast bivouac, and half an hour later we were sipping tea, which tasted like the best ever.

On our arrival at the Hermitage, Mrs. Thompson was congratulated by the guides and climbers. Usually on the return from a climb the guides made inquiry as to what kind of a time I had had, but on this occasion no questions were asked. But, as ever, I received a hearty welcome from "Baby," the four-year-old daughter of Mr. Cook, the manager of the Hermitage. She invited me to tea and told me that she would make the "Grand Traverse" with me the next year. The climb did not come off, as shortly after I was officially informed by the Tourist Department that I should not be allowed in these mountains again. They did not supply any explanation of their strange action; all they said was that they would not allow private guiding after that season—and, like the Wise Judge, refused to give their reason.

What was wrong? My explanation is as follows: In the season 1913-14 I was in New Zealand as private guide to

Mr. H. O. Frind, a Canadian climber. In that season an English climber, Mr. S. L. King, with two guides, Darby Thomson and Richard Richmond, were killed on Mt. Cook. I took part in the search for their bodies and later received a letter from the Tourist Department thanking me for the assistance I had given, and offering me a place on the guiding staff. I accepted and returned to the Hermitage in November, 1914.

At the end of the season I was again offered work, but I informed the department that I preferred to work as a private guide, and as no objection was made I returned to New Zealand in November, 1915. I had several engagements in advance and being well known had no difficulty in securing parties. Naturally, I took away some people from the government guides, which created jealousy, and, to make matters worse, this was in war time, when race hatred was fostered by all conflicting nations. Although I was naturalized before the war broke out, in the sight of the people, who did not have a mind of their own during that period, I was still an alien. The guides and their sympathizers complained to the department and no doubt the complaints were patriotic in design, but there is another angle as to why I was not wanted there. A good friend of mine, who claimed he had inside information, told me that all would have been well if I had not broken the mountaineering record of the Southern Alps, and that with an old lady, and that I should have kept my opinion regarding Zurbriggen's climb on Mt. Cook to myself.

Before continuing, I wish to inform my readers that I was never interested in making or breaking records of any kind in connection with mountaineering. Having been reared in the mountains and having made a few minor climbs before I lost my milk teeth, the experience I gained later has convinced me that the time required to climb a mountain depends entirely on the conditions under which it is done. This is the reason that I never could see any sense or merit in so-called record climbs.

What was the record climb at that time in New Zealand? I was informed that the "Grand Traverse" of Mt. Cook was considered by many climbers to be a great achievement. Having climbed fifty-nine peaks there, of which twenty-nine were first ascents, I agree with the sentiment, and go a bit further by saying that it will be looked upon as a great climb for many years to come. The first ascent was made on January 4, 1912, by

Miss Du Faur, with guides, Peter Graham and Darby Thomson. The time required was twenty-one hours from the bivouac on the Haast Ridge. Miss Du Faur in her book relates a great deal of step-cutting; it took them seven hours from the low to the high summit. I had the pleasure of meeting Miss Du Faur and the guide, Thomson, but did not climb with them, although I climbed several times with Graham. At that time I had sufficient knowledge to judge a man on the mountain. Graham was a good climber and guide; not every good climber makes a good guide.

Our time from bivouac to bivouac was about eighteen hours; the distance between the low and the high summit we covered in four hours including rest and time for photographs. On the day we made the ascent the snow was in good condition; there was no ice on the magnificent ridge which connects the three summits of Mt. Cook. I believe that if they had had such conditions they would have taken less time than we did; on the other hand, if we had met with the conditions they had we would probably have been defeated as I had no second guide.

I spent three seasons in New Zealand and came to the conclusion that where bad weather is concerned Mt. Cook keeps its pride of place. So it will not happen very often that the "Grand Traverse" is made in eighteen hours or less. I sincerely hope that someone has made or will make it in less time, so that no one will point me out as the holder of a climbing record. I am well aware that no alpine club offers encouragement to climb for the sake of making or breaking records, but there are individuals who climb, so to speak, with watch in hand. What joy they get out of it is often a mystery to others. According to observation their careers are nearly always of short duration, but in spite of this, some climb the ladder to fame without a breathing spell.

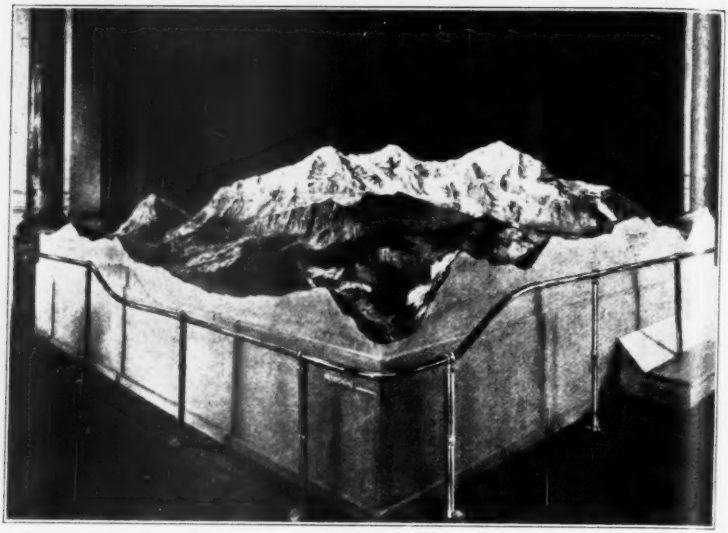
In a few isolated cases they are referred to as authorities on mountains, but nobody knows who is responsible for the authorization. Personally, I have noticed that climbers of this type have little if any sense of beauty; therefore, they find no excuse for stopping before they get to the top. Apparently they climb for climbing's sake, and in some instances to attract attention and publicity. No doubt, they get a kick out of it while it lasts.

If one can remember enough on a hurry-up climb for a pipe-dream I have yet to find out; but I have learned that quick climbing without stops is bad for the heart and other vital organs which

have to perform the extra work. I am not ignorant of the fact that there have been, and are yet, some guides who are inclined to encourage fast climbing. About thirty years ago at the Drei Zinnen Hut I listened to half-a-dozen guides discussing a record climb made by two young Viennese on the Langkofel. Amongst the guides was Sepp Innerkofler, and his remarks, roughly translated were: "Boys, don't you be foolish and encourage your tourist to get to the top in less time than your last. I tell you if this foolish idea of running up and down the peaks gets hold of the touristen, our mountains will be plastered with crosses and Gedenkstafeln!"

Innerkofler's prophecy did not exactly come true, although the crosses and tablets increased every year. There is one or more on nearly every mountain in the Alps, especially in Austria. Whether those signs have any moral effect on the climbers I do not know, but I know they have no effect on the local people. Neither is it exciting news to them when they hear of an accident. The following bears this out: An American climber at Hinterbärenbad, in the Kaisergebirge, asked the waitress how many accidents there had been in the last season; to which she replied calmly, "Oh, only thirteen got killed, and one man broke his legs."

Glancing back to Innerkofler's remarks we can read between the lines that running up and down mountains is not only foolish, it is dangerous. Sepp Innerkofler was one of Tyrol's outstanding guides, much liked by mountaineers of many nations. Like most, he was his own philosopher. His motto on climbing was "Eile mit Weile." If every climber from the beginning would adopt this motto and stick to it religiously, many accidents might be avoided.



RELIEF MAP OF THE JUNGFRAU GROUP

MUSEUM OF THE GERMAN AND AUSTRIAN ALPINE CLUB AT MUNICH

The Alpine Museum of Munich

HARRIET GEITHMANN

IN the heart of Munich stands the Alpine Museum on an island in the Isar River which travels across Bavaria for one hundred and seventy-five miles before it joins the blue Danube. A better location could hardly be chosen in this Bavarian city of 1,000,000 inhabitants. At Prater-Insel 5, close to Maximilianstrasse and within a stone's throw of the great Deutsches Museum of Industries and Science, which records the mechanical evolution of man from the stone age to the present day, stands this picturesque little Alpine Museum dedicated to the world of mountains, glaciers, flora and fauna and to the mountaineers everywhere.

Founded in 1910 by the German and Austrian Alpine Society, the Alpine Museum of Munich is housed in an attractive gray castle of rococo character with a green copper, turreted roof. One would hardly suppose that a castle would lend itself to the needs of a museum with such happy results.

In the extensive garden surrounding the castle are trees, rocks and alpine flora all labeled for the instruction of visitors. This garden is admirably suited for the display of mineralogical and botanical specimens and will in time serve as a complete open-air museum. Among the geological specimens are interesting stalagmites and stalactites and great boulders, measuring from forty to sixty centimeters in diameter which represent the most important rock formations of the Alps. To the average person these exemplify the general characteristics and peculiarities of their native structure far better than the usual small samples of mineralogical collections. They have been carefully selected to show the various phenomena of geology: the action of fire, water erosion and mountain pressure. Rocks of volcanic origin stand side by side with rocks of sedimentary origin and with the combinations of the two, the metamorphic rocks. In this alpine garden one may trace the geological history of the world by studying pages torn directly from the book of the mountains.

Entering the vestibule, the mountaineer is confronted with life-sized statues of an alpinist and a skier, graceful bronze figures

created by the sculptor, E. Geiger. The walls are covered with great paintings of alpine scenery.

In the central hall, downstairs, stands an immense relief map of the peerless Jungfrau and the surrounding Alps, created by X. Imfeld of Zürich on a scale of 1 in 2,500, which, with the exception of the Glockner relief, is one of the few, if not the only one, of similar size in existence. Not only is it remarkable for beauty and infinite fidelity to the details of mountain and glacier but, technically speaking, it is also a work of art. Imfeld spent many years of his life in its construction. The forests are represented in the background by 600,000 minute wire brushes which have been plastered in, thus greatly adding to the beauty of the relief as a whole. Here, too, are life-sized statues of mountaineers—painted figures of both men and women, showing their equipment and costumes for victory over lofty peaks.

The stairway leading to the second floor is a real art gallery, the walls being covered with colored pictures of alpine flora and photographic reproductions from Fischbach's original drawings showing the principal trees: pine, fir, larch, sycamore, mountain juniper and maple. Samples of the significant parts of these trees are preserved in formalin water. Measures have been taken for the protection of the modest gentian and the still more modest edelweiss, both of which are in imminent danger of extinction because of their popularity.

On the second floor of this castle-museum are paintings, views of the first ascents of the Alps, maps, optical instruments, manuscripts and mountaineering pins and emblems of all descriptions, ranging from silver ice-axes to silver clusters of the beloved edelweiss. The huge library is housed in another building. Cabinets of exhibits trace the history and development of alpinism, and there are special diagrams illustrating the fall and melting of the snows at various altitudes and different seasons of the year; other diagrams indicate the various zones of vegetation from valley floor to mountain top. Many specimens reflect the native life of the people who make their homes in the high country: richly decorated spinning wheels, doll cradles, embroidered belts, knives, forks and spoons embossed and inlaid with silver, pocket altars, watches and compasses. Here also are found rules and regulations of mountain hygiene and studies of the number of the blood

corpuscles in the climber and of how they correspond with certain altitudes and influence mountain sickness.

Particularly refreshing it is to visit this little Alpine Museum after one has trekked for miles through the endless corridors of museums of art, research, natural history, education, science, anthropology, traffic and engineering, *ad infinitum,* all over Europe. It is only a matter of time, when America will have one or more alpine museums of its own. The American Alpine Club has already begun a modest alpine exhibit in New York City. It has a valuable library of alpine literature, prints, photographs, maps, lantern slides, two relief maps of the Canadian Rockies, a case of geological specimens and a museum case of other rare items, manuscripts, etc. In due time there will also be a similar exhibit in the west, literally within view of the high Sierras, the snow-crowned Cascades or the saw-toothed Olympics—a museum sponsored by the mountaineering clubs of the Pacific Coast, one that will be a credit and an inspiration to alpinists everywhere as is the Alpine Museum of Munich today.

OTHER CONTINENTAL MUSEUMS

The following notes on other Continental museums may be of interest to mountaineers:

Vienna. The Imperial Art Museum contains a magnificent group of paintings by Peter Breughel, chiefly illustrative of peasant life. His winter landscape, showing the Rhone Valley near Villeneuve is noteworthy.

The Imperial Library contains an exhibit of rare maps, including the Peutinger table and the manuscript map of Switzerland by Conrad Türst (1497).

Klagenfurt. A small Alpine museum is housed in the Rudolfineum, a museum devoted chiefly to archæology. Chief among the relief maps is one of the Glockner group on a scale of 1:2,000 (1cm. = 20 m.). There is also the fine painting by Scheffer von Leonhardshoff, showing the start of Cardinal Salm on his expedition to the Gross Glockner in 1799.

Innsbruck. The Ferdinandeum (Museum Strasse) contains an excellent geographical collection, especially of the work of the early surveyors of Tyrol, Anich and Hueber. Burgklehner's "Eagle" map of Tyrol (1608), Ygl's map (1604) showing the Oetzthal glaciation, and Paul Dax's map of the Zillerthal are also to be seen. The Defregger room contains fine studies of the peasant types in action during the Napoleonic wars.

The Museum of Peasant Art (beside the Hofkirche) is the best of its kind in Austria: costumes, carvings, early room interiors.

The Innsbruck Section of the D. u. Ö A. V. (Rennweg 8) exhibits a relief of Tyrol (1:50,000) covering thirty square yards.

St. Moritz. The Segantini Museum (Campfer) contains notable examples of this artist's work, much of which was done in the vicinity of Maloja.

The Engadine Museum contains old furniture and rooms dating from the sixteenth century.

Chur. The Rhaetian Museum (beside the St. Martin's Church) contains numerous carved chests and other examples of Engadine art.

Basel. The Natural History Museum (Augustinergasse) contains ethnographical collections, the top floor being devoted to Alpine areas. The antique toys of peasant children are of especial interest.

Bern. The Bernese Historical Museum (Helvetia-Platz) contains early Swiss rooms, sledges, utensils and furniture.

The Swiss Alpine Museum houses the chief collections of the Swiss Alpine Club. The Matterhorn relief by Imfeld, and the models of huts are noteworthy. The Club has recently acquired the library of the late W. A. B. Coolidge.

Geneva. The Musée d'Art et d'Histoire (Rue Charles Galland) exhibits sketches by Rudolphe Toepffer, paintings by Calame, and the gorgeous altar painting by Conrad Witz (fifteenth century) depicting the Miraculous Fishing, with Christ walking on the water of the Lake of Geneva and the range of Mont Blanc in the background.

Chamonix. In the Hôtel de Ville, where the Paccard tablet will be unveiled at the time of the International Congress of August, 1932, is the Musée de Chamonix, containing excellent collections relating to Alpinism. The development of the ice-axe, the cowbell, the packbasket are shown in progressive series. There are some good prints, and such unusual items as the red plush mule saddle used by Empress Eugénie on her visit to the Mer de Glace, and the turret of the Janssen Observatory which once stood on the summit of Mont Blanc.

PROCEEDINGS OF THE CLUB

ANNUAL MEETING

The 29th Annual Meeting of the Club was held at the rooms of the Philadelphia Geographical Society, Walnut and Juniper Streets, Philadelphia, on January 23, 1932, at 2 P.M. President Ladd presided. Twenty-six (26) members were present.

The Treasurer's report was read by Mr. Fisher and on motion was approved and ordered filed. It showed income of $2,360.97; $750.35 was interest and dividends, $67.69 from sales of Guide Books, $32.93 miscellaneous, and $1,510.00 dues from members, 112 members paying dues at the $10.00 rate; expenses, rent $1,050.00; printing and stationery, $168.91; New York Public Library, $50.00; AMERICAN ALPINE JOURNAL, $904.33; miscellaneous, $50.20, total $2,223.44, making a gain of $137.53 for the year.

The assets of the Club are: Chase National Bank, balance $528.10; Brooklyn Savings Bank accounts, $7,827.64; guaranteed mortgages, $7,000.00; General Gas & Electric Co., 6% preferred stock, $991.67, and Explorers Club Income Bonds, $6,000.00, total, $22,347.41.

The report of Miss Helen I. Buck, Librarian, was read. It mentioned numerous accessions to the library, the principal one being the gift of over five hundred volumes by our European member, Mr. Henry F. Montagnier. After expressions of appreciation of this gift and the arduous services of the Librarian in cataloging and arranging the Library, the report was approved and ordered filed.

The Entertainment Committee presented no formal report but the holding of two informal meetings at the Club rooms was mentioned, also an informal reception for M. Escarra, President of the French Alpine Club.

The Special Committee on Club Rooms, Mr. Howard Palmer, Chairman, reported that after investigating a number of alternative sites, a lease for three years had been arranged with the

Explorers Club, with rental of $1,200.00 per year, to include the room now leased by the Club and the room adjoining in which many of the Club's books are now housed. The rental of these two rooms had previously been $2,500.00 per year. The report was approved and ordered filed.

For the Committee on Publication of Climbing Records, Mr. Hall reported that the records of all but seven of the members were in hand and ready for publication.

The Nominating Committee, Mr. Thomas D. Cabot, Chairman, presented the following report for nominations for offices:

President:	Henry B. DeV. Schwab, New York City.
Vice-Presidents:	Daniel Underhill, New York City. James G. Rogers, Boulder, Colo.
Secretary:	J. Monroe Thorington, Philadelphia, Pa.
Treasurer:	Joel Ellis Fisher, New York City.
Councillors:	
1932-1935	Frank N. Waterman, New York City. Dean Peabody, Jr., Brookline, Mass.
1930-1933	William R. Hainsworth, New York City. S. Prescott Fay, Boston, Mass.
1931-1934	Howard Palmer, New London, Conn. Henry S. Hall, Cambridge, Mass.

It was moved and seconded and unanimously carried that the Secretary should cast one ballot for the above nominees. This was done and the nominees were declared elected.

The President reported the death of our beloved first president, Prof. Charles E. Fay, which occurred on the day following our last Annual Meeting, and that a memorial of his life and services had appeared in the last number of THE AMERICAN ALPINE JOURNAL.

The propriety of defining "amateur status" as a qualification for membership in the Club was presented.

After extended discussion, from which it appeared that any definition of amateur standing by which we should attempt to con-

trol nominations and elections, would involve many technical distinctions and unprofitable debates; and that by reason of the non-competitive nature of mountaineering no such definition was necessary; and that any five members have full power to prevent the election of any nominee of whom they do not approve:

It was moved and carried that candidates for membership be acted upon by our Directors and members on the basis of their individual qualifications as heretofore, leaving their final acceptance or rejection to be determined by the judgment of those making the choice.

The meeting then adjourned and the following informal illustrated talks were given:

Dr. J. Monroe Thorington: Report of exploration in the Purcell Range, Canada, south of the Lake of Hanging Glaciers, determining the watershed of Findlay Creek, the details of which are not correctly stated on any existing map.

Miss Georgia Engelhard: Ascent of Mt. Chancellor, which has not been climbed since its first ascent by Sir James Outram in 1901; ascent of Mt. Vaux and the lengthy traverse of Mts. Abbott, Afton, Swanzy, Clark and Bonney, at Glacier, B. C.

Dr. Max M. Strumia: Ascent of Aiguille Savoie by the southeastern ridge, a difficult climb made more difficult by heavy snow.

W. Osgood Field: Exploration of the surroundings of Cook Inlet, Prince William Sound, Alaska; the study of the other large glaciers, some of which have retreated, some advanced and some have alternated. Illustrated by both still and moving pictures.

Henry S. Hall, Jr.: Aeroplane views of Mt. McKinley and its surroundings.

ANNUAL DINNER

The annual dinner of the Club was held the same evening at Hotel Bellevue-Stratford. About fifty members and guests attended.

President William S. Ladd presided. After a brief discourse dealing with problems of the Club which had come up during

his term of office and a graceful expression of his appreciation for the cooperation extended by the members and councillors in carrying on the Club work, he introduced the following speakers:

Mr. Rand Herron, who described with lantern slides the climbing carried out in the Kaisergebirge by the modern German rock-climbing school, and

Mr. Allen Carpé, who told the story of the recent Mt. Fairweather expedition, which resulted in the first conquest of that magnificent Alaskan peak.

LOCAL INFORMAL MEETINGS

An informal gathering of the members was held at the Club rooms in New York City on the evening of February 1st, 1932. A lantern lecture by Ansel F. Hall, Park Naturalist of Yosemite Park, dealing with mountaineering in the Sierra Nevada gave much pleasure to the considerable company present. Of special interest were slides showing early pioneer travelers, quaintly costumed, in the region of Yosemite Park. Among other climbs the lecturer described an interesting ascent in the Palisade group made last year by himself and Francis P. Farquhar, recently our western Vice-President. Members present enjoyed the privilege of meeting Mr. Henry F. Montagnier, a resident of Switzerland, whose last attendance at a Club gathering occurred some twenty years before. The latest installment of his munificent gift to the Club of richly bound books was on view.

On the evening of February 8th, 1932, a meeting of members residing in the vicinity of Boston was held at the residence of Henry S. Hall, Jr., in Cambridge. Lantern talks by the host on Mt. McKinley, by S. Prescott Fay on a journey from Jasper to Hudson's Hope and by Dean Peabody on his recent ascent of Lizard's Head, entertained the company which numbered about thirty. A buffet supper was served. Messrs. Hall, Cabot, Fay, Peabody and Miss Hurd constituted the committee in charge.

On March 12, 1932, an informal dinner in the third-floor lounge of the Explorers Club in New York City was arranged by the Entertainment Committee. President Schwab and the guest of honor, Frau G. O. Dyhrenfurth, received in the Club rooms and some forty members and guests attended.

Mrs. Dyhrenfurth gave a most interesting talk on the "Kangchenjunga Expedition of 1930" illustrated with beautiful lantern slides. Her pictures also included some showing the opposite side of the mountain where the Paul Bauer Expedition attacked the following year. Mr. Palmer was called upon for brief comment.

William B. Willcox described his last summer's ascent of the Breithorn (Zermatt) by the "Young Arête" under the leadership of Franz Buener. A few remarks were then made by Dr. Nichols.

Rand Herron spoke on "Rock Climbing in the Kaisergebirge and Elbsandstein Gebirge," describing in detail the special technique involved. His fine pictures showed much actual climbing, as well as some of the objectives and their complicated routes. Mr. Carpé afterwards added a few remarks.

The very enjoyable proceedings were closed with a vote of thanks to the speakers and to Mr. Beckwith, Chairman of the Entertainment Committee, after which many returned to the Club rooms to converse and view the important new additions to the library.

THE CLUB ROOM SITUATION

Our original lease with the Explorers Club expiring on December 31st, 1931, matters were placed in the hands of a Special Committee appointed by President Ladd in the late autumn.

As a result of their negotiations, a further lease was obtained at a reasonable figure not only on the actual Club room, but also on the two adjoining rooms which for some time had been at the disposal of the Club through individual generosity.

A wide doorway was cut through between the Club room proper and the center room, and the cases and furniture were rearranged so as to provide more space for assemblage in the former, and consolidate nearly all the book stacks in the west room.

The splendid donation of books and periodicals from Mr. Henry F. Montagnier were catalogued and filed in time for members and their guests to inspect when they assembled in the Club rooms for the informal dinner of March 12th. The dinner itself was held in the third-floor lounge of the Explorers Club and provided ample and most suitable space for some forty-five covers.

Most unfortunately it has meanwhile become necessary for the Explorers Club to give up the occupancy of their building at 544 Cathedral Parkway because of economic conditions. At the moment of writing—June 1st—they are in the process of moving into new quarters at the Hotel Majestic, 72nd Street and Central Park West.

Anticipating some such development, the Council Meeting of April 2nd placed the situation with regard to our Club rooms in the hands of the Finance Committee—*i.e.*, Underhill, Ladd, Fisher and Schwab—with power to take such action as seemed necessary and desirable.

This Committee is now negotiating with the agents of the building with a view to our remaining in the present location for the next five months at a greatly reduced rental. In the autumn we shall have to solve the problem of where to move to, it being obvious that it would not be desirable to remain where we are after withdrawal of the Explorers Club and the facilities offered by it.

Quite possibly it may prove best for us to take quarters in the Hotel Majestic also, if a reasonable rental can be achieved and arrangements made for the occasional use of the Explorers Club assembly room there.

This location, while not the most convenient, is certainly much more convenient than the present one, and there are many advantages in maintaining a close contact with the Explorers Club.

The undersigned will welcome suggestions and expressions of opinion on this matter by members, and deeply regrets having to advise this impending change of location which the Club will be compelled to make in the autumn.

HENRY B. DEV. SCHWAB,
President.

IN MEMORIAM

ALLEN CARPÉ
1894-1932

In the death of ALLEN CARPÉ American mountaineering has lost one of its most enthusiastic and accomplished advocates. He was born in Chicago, December 20th, 1894, a great-grandson of Ezra Cornell, founder of Cornell University; grandson of the American poet, Coates Kinney. His father, Professor Adolph Carpé, was an accomplished musician but died while Allen was still young. His mother, a brilliant woman, survives him as do his wife and two small daughters.

Carpé spent his early years in Xenia, Ohio, at his mother's home. He was taken to Germany at ten years of age for his preliminary academic training. There he completed his gymnasium courses with honor. After a year at the University of Berlin he returned to New York where he graduated from Columbia with a degree in electrical engineering. The great war broke into his academic work. Leaving it, he joined the Officers Training Corps at Plattsburg and received his commission as second lieutenant in the Coast Artillery Section, Officers Reserve Corps, August 15th, 1917. December, 1917, saw him as a battery officer, 51st Artillery, Coast Artillery Corps. With it he went through the St. Mihiel offensive, his battery being especially cited "for the manner in which it pushed its guns forward into the conquered territory in spite of constant shell fire and bombardment of mustard gas." He was gassed in action and wounded slightly, but out of action for five days only. Entering active service as a second lieutenant he left it as a captain and in 1924 was made a major, Coast Artillery Officers Reserve Corps.

In 1920 he entered the service of the American Telephone and Telegraph Company as a member of the Department of Development and Research. He contributed in a large way to the development of systems for multiplex transmission by means of modulated high-frequency currents. He had much to do with the development of a standardized product in several models which had a large sale to the operating units of the Bell System. He knew the technical aspects of the telephone business thoroughly,

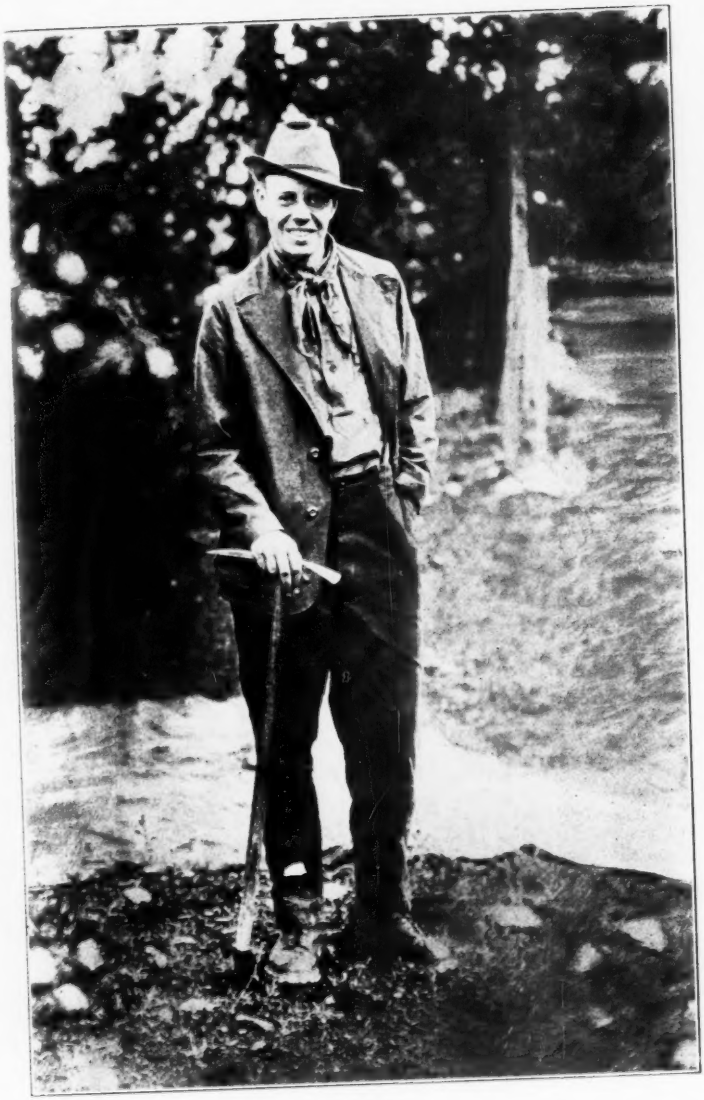
and held a number of patents in it and in the related fields of the telegraph and radio. Besides this his knowledge extended to cost studies and economic and business surveys. He had the responsibility of comprehensive tests and investigations and had been called upon to act in the capacity of a consultant in a number of cases. His knowledge of foreign languages made him sought out to advise in regard to foreign patents and systems.

His love of the mountains was formed in his school days while in Germany. He soon acquired the habit of spending his vacations in the Carpathian Mountains or various groups in the Eastern Alps. Rock climbs first interested him and he soon excelled in this type of climbing. For about six years he gave his attention almost exclusively to rock work, some of which was most exacting. In 1912 and 1913 he experienced his first work with snow and ice, but not until he came to the United States did he become greatly attracted to actively glaciated peaks.

In the mountains of Canada he found not only the appeal of high peaks, but that of the wilderness also. He delighted in venturing alone on expeditions of several days' duration which gave him both climbing and forest travel. His activities in the Selkirks, the Cariboos and Rockies are well known to all who have followed North American mountaineering literature.

In 1925 he was a member of the expedition which ascended Mt. Logan. He considered this one of his greatest adventures. In 1926 he tried Mt. Fairweather; 1927 saw him making first ascents again in the Cariboos. In the fall of that year he married Kathleen MacBain and in 1928 they visited the Gold Range and Mount Robson, climbing together in both regions.

But Alaska constantly called more and more persistently. In 1930 he made, with Andrew M. Taylor and Terris Moore, the first ascent of Mt. Bona. In 1931 he and Moore reached the summit of Mt. Fairweather—a much-coveted goal. He told me afterward that it was the most difficult snow and ice ascent he had made. A quotation from a letter written to Mrs. Carpé as he sailed northward in March of this year expresses well his love for the Alaskan mountains. "This country has lost none of its fascination for me in the last four years which have changed so much else in my life. . . . It is wild and sombre, very different from those Canadian mountains you visited. It is more like Albreda than Jasper or Robson, but it is probably more like



ALLEN CARPÉ

Norway or some parts of Scotland. Those places we visited in Canada one can readily think of as casual vacation resorts, but this country stays with me. It has haunted me for years, as you know, and I doubt if I will ever be really satisfied until I have tried to live in it."

Allen Carpé was a quiet, shy man. He had a great fund of information on all sorts of subjects, and, when he so chose, contributed in an informative and authoritative manner to any conversation. He had a clear, calculating mind; was precise in his methods and had little patience with inefficiency. I have known no other mountaineer more competent than he, nor have I ever seen or known of his making a false step. His judgment of probable routes on a mountain was excellent. He was always thoughtful of others and when wearing the rope, very careful and watchful in its management. He had great self-confidence and unusual courage and daring. He was not a rapid goer, nor did he show speed in step-cutting. All his efforts I shall always think of as being governed by one motive—precision.

Although not an easy mixer, Carpé had an engaging smile and pleasant manner. His diffidence was due rather to shyness than to offishness. He was likely, in his accounts of adventure, to be matter-of-fact in the extreme, being rather afraid that he might err on the side of the romantic. He was not superstitious and his philosophy had a decided Nietzschean flavor. He was not troubled by the problems of the next life, but felt that this world would be the happier if more of us bent our efforts in making heaven on earth rather than preparing for it elsewhere. With this, he had enthusiasm for life and adventure which at times shone forth in outbursts of contagious delight.

W. S. Ladd.

New York,
June, 1932.

It is with a heavy heart that one learns of the loss of a comrade of the mountains. Allen Carpé and I shared many fine ascents together in the Canadian Rockies between 1919 and 1923 and I never met a keener enthusiast for new paks and the exploration of primeval mountain wilderness. One of our best expeditions was Mt. Serenity near Fortress Lake, made possible by the accidental discovery of a hidden canoe, which, however, leaked so copiously that only his continual bailing during the six-mile trip

across the lake enabled us to land ourselves and supplies on the farther shore. At this time we got a good view of the approach to Mt. Clemenceau and Allen took advantage of it on the expedition which he made in 1922 with Messrs. H. B. Schwab and H. S. Hall to the vicinity of that imposing peak.

Another very satisfactory campaign that we carried out together (again by means of a small canoe) resulted in the finding and climbing of Mt. Brazeau near the south end of Maligne Lake, and then later in the first ascent of Mt. Unwin. We took observations from which Carpé subsequently constructed a good map of the lake, the largest in the Rockies.

These and other similar trips no doubt proved helpful in connection with the greater enterprises which he undertook soon afterwards: the two arduous journeys in the Cariboo Mountains (1924 and 1927) and then the splendid Alaskan expeditions to Mt. Logan, Mt. Bona and Mt. Fairweather. On the Mt. Logan expedition, he went as the representative of the American Alpine Club and most worthily he fulfilled his mission.

His interest in the Club was always of the deepest. It was especially shown by his volunteering to take charge of the first issue of *The American Alpine Journal* in 1929, and he assisted on its editorial board as much as his lengthy absences permitted, up to the time of his death. He served on the council of the Club during the six years from 1926 to 1931.

He was a member of the British Alpine Club, the Alpine Club of Canada, the Explorers Club and a Fellow of the Royal Geographical Society. Numerous papers in their publications attest the accuracy and range of his observation of natural phenomena. They will prove of permanent scientific value. Allusion may be made here to one of the most recent, "The Conquest of Mt. Fairweather" in *The Alpine Journal* for November, 1931. It is almost epic in its restrained yet forceful style—a moving narrative of a great mountaineering achievement. The editor appends this note to the paper: "We must congratulate the party on a magnificent expedition. The ascent of Mt. Fairweather is, we understand, the hardest yet accomplished among the 'Arctic' mountains of North America."

His demise comes at the height of his alpinistic career and that is probably as he would have wished it. His letters show that as time went on he was becoming more and more devoted

to the mountains and it seems probable that his activities would have resulted in even greater successes had he been permitted to persevere. The Club has lost a loyal member and his friends a great and true companion for the peaks.

HOWARD PALMER.

THE MT. MCKINLEY DISASTER

Death came to our member Allen Carpé and his companion Theodore Koven on the Muldrow glacier of Mt. McKinley on or about May 9th, 1932.

The expedition, which left Seattle April 16th, was organized primarily for the purpose of carrying out certain cosmic ray observations for Prof. A. H. Compton of Chicago. The other members were Nicholas Spadavecchia, Percy T. Olton and E. P. Beckwith, the latter also a member of the Club.

Whether or not some of them would attempt to climb Mt. McKinley was to be determined after their scientific experiments on the upper Muldrow glacier had been concluded.

Several airplane trips carried the party and most of the supplies from Nenana to the 6,000 foot level on the Muldrow glacier close to McGonnigal Pass (formerly known as McFee Pass), whence, by successive relays, Carpé and Koven established themselves at the head of the Muldrow at 11,000 feet on May 2nd.

Another party, comprising Alfred D. Lindley, Erling Strom, Harry J. Liek and Grant Pearson, having ascended both summits of Mt. McKinley, descended Karsten's ridge in the early morning of May 11th, 1932 to the tents of Allen Carpé and Theodore Koven whose location they knew well, having previously freighted up and cached some eight hundred pounds of equipment and scientific apparatus for them on their way in by dog-teams.

Surprised at finding no one there, members of the party circled around the tents seeking traces. The camp was in perfect order, but there was considerable fresh snow on the tents, and the conclusion was that the occupants had been gone at least forty-eight hours. All personal outfits, sleeping-bags and packboards were there. Both Carpé's and Koven's diaries were found and read, it being noted that their last entries were for the 7th.

Carpé's diary of cosmic ray observations was not read by them, and it was not until this reached New York that it was found

to contain a full set of observations for several days including the 8th, and one observation subsequent thereto for 6.30 A.M., presumably for the morning of the 9th. Thus the question presented itself as to whether Koven went off alone toward McGonnigal Pass on the 8th, and Carpé followed on the 9th. The omission of any entry in Koven's diary for the 8th is, however, not conclusive; and it is the opinion of Lindley and Strom, supported by the weight of the following evidence, that they went together on the 9th.

Having cooked a meal in their own tent and rested a little, the Lindley party set out down the glacier in their old tracks, still visible here and there. Occasional ski tracks were seen and these were assumed to have been those of Carpé and Koven.

About one and a half miles below the 11,000 foot camp the party came across the body of Koven exactly in their old trail and considerably snowed up. Much new snow had fallen on May 10th. Liek and Pearson waited while Lindley and Strom returned to the camp for the sledge that had been abandoned there. The body was then placed on the sledge, but they had scarcely dragged it a few hundred feet before Pearson fell into a crevasse, jammed some forty feet down, and was extricated with difficulty. They then buried the body in the snow wrapped in a pup tent and marked the spot with the upright sledge, roped up again and proceeded to follow Koven's wandering tracks. These led, in a few hundred yards, to a big crevasse slightly off the old trail where it swung around an avalanche fan.

From the tracks still to be seen it appeared that the first man had gone over safely and that the bridge had broken as the second man crossed. Lindley and Strom base their opinion on the fact that the ski tracks which were side-stepping near the edge of the crevasse, were on the *lower* side, and they do not see how they would be there unless the first man had returned after his companion had fallen through. They feel quite certain that the first man fell in also in his efforts to look into the crevasse and locate and assist the second man.[1]

[1] It is a source of keen regret to their friends that more is not known about the harrowing disaster that took the lives of these gallant mountaineers. Photographs show that about a foot of new snow fell on the Muldrow glacier after its occurrence and did much to obliterate traces that otherwise might have proved of great significance. A party consisting of Messrs. Merl LaVoy and Andrew W. Taylor has just returned from the

The fatal crevasse lay transversely to the general route but it may not have been come upon at right angles. That the crevasse was bridged over before the accident is a matter of opinion, a probability that cannot be proven. Lindley and Strom describe it as a bad one with over-hanging lips that sloped downwards, dangerous of approach. It lay in an area of open and bridged-over crevasses, a little off to the left of the old trail.

An ice-axe with a pair of crampons hanging on it was stuck on the inside end and lower side of the fatal open part of the crevasse. There were no marks on the ice-axe that would indicate whose it was, nor was it certain that this was the point where Koven emerged from the crevasse, though it appears likely.

It is positive that one of the two was on skis, and it seems most probable that both were so equipped. They were not roped, one rope having been cached at about 12,640 feet on Karsten's ridge, and the other being at the 6,000 foot camp. Which of the two, Carpé or Koven, fell in first cannot be determined, assuming that they were travelling together.

By this time it was evening and all of the Lindley-Strom party were very tired, two of the members being quite done up. They called loudly at the crevasse, without receiving an answer and knowing that the accident must have occurred more than forty-eight hours previously, they felt certain that Carpé could not be alive. Without venturing to approach the crevasse closely in order to look in, they then passed by it and continued down to the McGonnigal Pass camp, which they reached about 4.00 A.M. on the 12th. Thence, they marched out to McKinley National Park Station where they arrived on the 15th, and immediately sent an

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Muldrow glacier having located and brought out the body of Theodore Koven but no additional details regarding the tragedy were discovered by them.

The division of the party was due to the inability of Olton and Spadavecchia to leave New York until a week later than Carpé, Koven and Beckwith. The latter three flew in to the Muldrow glacier and Carpé and Koven at once proceeded upwards to establish their 11,000 foot camp where Olton and Spadavecchia were to join them upon arrival. As it turned out, the entire party never in fact got together on the mountain. Carpé employed the interval to conduct cosmic ray observations, of which he secured many. There have been recovered and will be utilized in the world-wide scientific studies now being carried out. The purpose of the measurements is to determine the possible effect of the earth's magnetic field upon the cosmic rays. The observations on Mt. McKinley are the most northerly ones which can be made at any appreciable elevation. Three hundred and fifty pounds of equipment for the ray observations alone were taken to the 11,000 foot camp on Muldrow glacier.—*Ed.*

airplane in for the sick Beckwith at McGonnigal Pass camp and instituted search for the missing Spadavecchia. The record would not be complete without mentioning the fine work done by the flyers Crosson, Jones and Robbins of the Alaska Airways.

To Messrs. Lindley, Strom, Liek and Pearson we extend heartiest congratulations on their successful ascent of both summits of Mt. McKinley, and sincere thanks for their actions in connection with the tragedy.

HENRY B. DEV. SCHWAB.

BOOK REVIEWS

Climbs on Mont Blanc, by Jacques and Tom de Lépiney, translated by Sidney Spencer. Pp. 179. Edward Arnold & Co., London, England, 1930. 10/6.

The well-known intrepidity of the brothers de Lépiney is brilliantly, and withal, modestly exhibited in this very convenient-sized volume, containing impressive, if rather small, pictures of their daring and guideless climbs. Their enthusiasm for the magnificent arêtes and peaks of the Mont Blanc chain is communicated to the reader through unusually lively and intimate descriptions, in which French and Italian writers excel. Other French climbers, J. Lagarde, Henri de Ségogne, and Henri Bregeault, joined the brothers on some of these thrilling exploits on notched knife-blades, vertical walls, dangerous ice-cliffs, chimneys with overhangs, and difficult, exposed cracks. References to previous climbers, in particular English craftsmen, are numerous.

The longest chapter, covering fifty pages, describes climbs on the Italian face of the Monarch. There are vivid accounts of the arduous and risky traverse of the Brenva col and the ascent of the Aiguille Blanche on which Jacques de Lépiney made his ninth bivouac. Apart from technical excellence of the writing in which the volume abounds, there are attractive personal touches such as "the bearing of Lagarde (on the last-mentioned climb) emitting a halo of energy and sane boldness," and of Jacques, after being lifted by an electric discharge on the summit arête of Mont Blanc, sliding down a couloir and owing his salvation to a rope which had been luckily wound around a rock. His ice-axe, crampons and rucksack disappeared forever. Safety had to be sought by lying flat on the snow; a not unusual experience, which along with nights spent at exposed elevations, raises the question, whether one really climbs for pleasure and the enjoyment of a holiday.

The Clochers de Planereuse provided most arduous climbing for the two brothers, who found in them a problem involving extreme muscular and nervous tension and demanding all their

technical skill. After two unsuccessful attempts with other climbers, the brothers negotiated the Pointe de Lépiney. This involved another and tenth bivouac, during which they were disturbed by a fall of snow. On all their climbs *rapells* were in constant use. The Aiguille du Peigne, a magnificent climb, accomplished by the brothers and a companion by the Chamonix face and west arête, after several attempts, "offers 700 meters of one of the finest walls of the Alps." A solitary slab near the summit reduced them to seeking the aid of comrades, who had reached the top by a different route, and who pulled them up by the rope.

The Pointe Lagarde and northeast face of the Aiguille Verte involved a tremendous struggle for the experts Lagarde, de Ségogne and Tom de Lépiney. On the way back all got stuck in the treacherous snow of the bergschrund, not far above the Couvercle, and had a narrow escape from being benighted and perhaps finished.

Ice- and rock-work of the first order of difficulty were involved in reaching the Caïman-Crocodile arête and the ascent of the Aiguille du Plan by the north face. The leader, Tom de Lépiney, pays a fine tribute to the moral and intellectual qualities of his companions, de Ségogne and Lagarde: the former the gayest and safest of all, the latter "of powerful impulse, phlegmatic, and climbing with a monocle in one eye."

This book will be enjoyed by all who have climbed in the Mont Blanc district. The translation appears to be accurate, but occasionally rather too literal. Recognizing that mountaineering in Europe has necessarily narrowed its field, and that whereas the aim of explorers was, in the first instance, to reach the highest points by any, and usually the easiest routes, the aim now is to vanquish the peaks by the hardest ones, the authors oppose the view that this must, of necessity, lead to a diminution of esthetic enjoyment in climbing. "Quite on the contrary, we believe with Mummery that the most difficult walls are often the most beautiful, and that it is from near at hand that they should be seen; we are convinced that the impression of beauty derived from a mountain is closely connected with the efforts accomplished in conquering it" (p. 153). But does the infinite variety of emotions and views which succeed one another during the course of an ascent always heighten our receptivity for esthetic impressions?

J. W. A. H.

Geologic History of the Yosemite Valley, by François E. Matthes. Washington, Government Printing Office, 1930. U. S. Geol. Survey Professional Paper 160. $1.10.

This long-awaited monograph on the Yosemite Valley sets forth the evolution of the valley in language understandable by the layman as well as by the specialist.

The work, which has resulted in this interesting publication, was undertaken by the Geological Survey as a result of a general and popular demand voiced by the Sierra Club for a complete and readable story of this masterpiece of nature. The field-work, which was commenced in 1913, has led the author over a large part of the Sierra and as a result he does not need to limit himself narrowly to the Yosemite Valley but draws upon other localities further afield for illustration. The natural consequence of this, combined with a fluent style, is a most interesting and readable account.

The author's researches on the glaciation of the Sierra are noteworthy and will make this paper a source work and standard of comparison for many years to come.

The book is abundantly illustrated with many fine halftones and sketches and is provided with a number of maps for reference. An appendix contains a study of the granitic rocks of the region, contributed by F. C. Calkins.

Every lover of the mountains as well as every lover of the Yosemite will desire a copy of this excellent monograph among his books and it is well worth the price charged.

K. A. H.

Men, Women and Mountains, by Sir Claud Schuster, G.C.B., C.V.C. Pp. 143. Ivor Nicholson and Watson, Ltd., London, England, 1931. 12/6.

"It is a paradox that mountaineering, whose spiritual impulse is a Wordsworthian desire for solitude, should depend for half its exercise on comradeship. . . . There are solitary climbers. But the ordinary (and may we not add, the prudent?) mountaineer is dependent upon his companion (sometimes in the most literal sense). In action, as in sleeping and waking, every member of

the party acts on every other member." Thus writes the author at the beginning of the chapter (pages 56-75), which gives the title to his book. Interesting descriptions are forthcoming of some of the older members of the Alpine Club with whom he climbed in Switzerland, and of one whom he accompanied on his 250th ascent of the Riffelhorn.

A delightful opening chapter entitled "The Middle Distance," while necessarily retrospective, is chiefly concerned with the perennial question, "What is mountaineering?" and, "Why do it at all?" Partly, answers the author, to satisfy two instincts which are presumably atavistic; the desire to get to the top, and the appetite for a little mild discomfort, suggesting the pleasure of a normal child in standing on the top of a sand heap and in covering itself with dirt. "To these I would add a third, which, though common, seems not to be universal; the desire for the other side, to look into a strange land or a new valley." In mountaineering, epic and romance are strangely compounded. The experiences clear the mind and enable it to see things as they are. One's new knowledge may only concern one's digestive apparatus, or it may illumine one's guesses about the governance of the universe.

The rather brief closing chapter, "The Joys of Mountaineering," stands in close connection with the first. Another chapter is concerned with "Walks in the Central Pyrenees." "A Day's Pleasuring," "Maloja," and "Recollections of a Derby Dog" describe skiing experiences in the Oberland and Bernina districts. The admirably printed, charmingly written, although somewhat slender volume, contains some good pictures, including a striking photograph of Edward Whymper in his later years.

J. W. A. H.

By Cargo Boat and Mountain, by Marie Beuzeville Byles. J. B. Lippincott Co., Philadelphia, Pa., 1931. $5.00.

This brief but vivid account of an unconventional world tour, wherein the authoress attempts to cover as many mountain regions as the slow but comfortable speed of various cargo boats would allow, is interesting for its variety and the tempo with which the reader is carried along from one incident to another.

The climbing is at first the always pleasant hill scrambling and hiking, starting in Australia (with good Australian bush-whacking) and then shifting to the Lake District of England, Skye and northern Scotland. A visit to Norway, and the spell of the high hills is cast not to be broken. The scene then changes to the more familiar Canadian Alps and the story of the climbs in the Purcells and the Rockies follows. Perhaps even more interesting than these, however, are the reactions of a visitor, to Canadian and American customs. The writer has definite views which she does not fail to express; in particular she does not appear to have been too much impressed by a well-known Canadian railroad. Guides in general and one in particular come in for a certain amount of criticism and we can only conclude that the authoress has been the victim of much ill fortune, for while the generalization that guides are lazy and not disposed to work is often true, it has like every other, its glittering exceptions. But then, much depends on the indefatigable energy of the tourist: we remember one American gentleman who wore out, some say, half the guides in Switzerland in the course of a single summer.

The book is very pleasant reading, and although well gotten up and illustrated is priced rather high, which will undoubtedly deter many who would like to own it as a pleasant remembrance of the mountains.

K. A. H.

Fourteen Thousand Feet: A history of the naming and early ascents of the high Colorado peaks, by James Lathrop Jerome Hart. Second edition, with a Climbers Guide to the high Colorado peaks, by Elinor Eppich Kingery. Denver, Colo. Colorado Mountain Club, 1931. $1.00.

This enlarged and revised edition of the original work published in 1925 will be found most useful to mountaineers and those interested in the Colorado Rockies. Noteworthy are the addition of subheadings which make for easier reference, and the addition of illustrations. The map has been redrawn in the light of later topographic knowledge, but is not as legible as the former one

and is perhaps a bit confusing to those not acquainted with the country.

The climbers guide which has been added is only a beginning, but the incisive and businesslike manner in which it is written is very commendable. We hope that it will be the humble precursor of a more ambitious climbers guide to the mountains of Colorado on the same order as the well-known climbers guides to the Alps.

Altogether this is a most useful compendium of information on the mountains of Colorado and a booklet which should be in every well-informed mountaineer's library.

K. A. H.

The Italian Expedition to the Himalaya, Karakoram and Eastern Turkestan (1913-14), by Filippo De Filippi, xvi + 528 pages; quarto, with chapters by G. Dainelli and A. Sprenger. Illustrated with two colored plates, fifteen panoramas, four maps, and more than 300 illustrations in the text. Edward Arnold and Co., London, England, 1932. Price 50s.

This book contains the record of an admirably planned and convincing program in the interests of science and exploration across one of the world's most dramatic frontiers. It is a unique contribution to the literature on the region adjacent to the watershed separating Northern India from Central Asia, linking the present with the past by frequent reference to journeys made by missionaries, scientists and explorers, who, through the centuries, have traveled that way in the interests of various nations.

A comprehensive review is difficult, as it is almost impossible for the casual reader to adjust his sense of values to fit the vastness of Indo-Himalayan topography and the problems to which it gives rise. It is equally difficult for the layman to comprehend the nice decisions made in various fields of allied sciences. De Filippi states, "This book contains an account of the expedition across India, Baltistan, Ladak, and Russian Turkestan." This places the scientist's endeavor on the map from the political viewpoint, but for clear understanding of the narrative a knowledge of the topographical background is essential.

The region dealt with is marked by the variety and importance of unsolved problems, as well as for fruitfulness as a field of research. Confronting the members of the expedition, each in a particular field, were problems in geology, morphology, and glaciology, data on which had been previously based largely on hypotheses and contradictory theories. Major geographical problems had not been satisfactorily investigated, and the unsatisfactory classification of the colossal ranges crossed, called for reconsideration. The expedition proposed to institute researches in meteorology and aerology, as well as measurements of various forms of radiation. De Filippi's particular field, that of gravity measurements, was to serve as a basis of study of Himalayan formation, and, in general, as an approach to the question of distribution of terrestrial masses.

Of the topographical results, among the most interesting was the fixation of the relations between the Rimu Glacier, source of the upper Yarkand River, the Shayok River and its tributaries, and the Karakoram Pass.

A comprehensive series of photographs illustrate the volume, although quality is lost in those printed on text paper.

J. G. H. and J. M. T.

The Teton Peaks and Their Ascents, by Fritiof M. Fryxell, Grand Teton National Park, Wyo. The Crandall Studios, 1932; printed for the author by the Augustana Book Concern, Rock Island, Ill. $2.00.

This short account of the history of the climbing of the principal peaks in the Teton Range is what the western climber has long sought for in vain. It is, as the author states in a foreword, essentially the same material as appeared in a series of articles from the same pen in *Appalachia* (June and December, 1931, and June, 1932), but revised and consolidated to give a concise text for easy reference.

All the well-known references to these mountains are cited. Many obscure ones, as well as unpublished material, are quoted or paraphrased for the reader's benefit. No longer is it necessary to spend many arduous hours of patient research to ascertain which peaks have been climbed and when. The routes of ascent

are given, as are the names of the parties and the dates, so the book may be accepted as one of the first climbing guides to the mountains of the western United States. But it is really more a monograph on the climbing history and as such will delight the heart of every mountaineer who has ever seen the peaks and pinnacles of the Tetons rising sheer above the level floor of Jackson Hole.

The book itself is well gotten up, well printed, on good paper with wide margins and many illustrations of invariable excellence, and is well worth the modest price asked, being a much-to-be-desired addition to any mountaineer's library. Copies may be obtained from the Crandall Studios, Jenny Lake, Wyo., or from the author.

K. A. H.

Adventures of an Alpine Guide, by Christian Klucker, translated by E. and P. Gaisberg; edited, with additional chapters, by H. E. G. Tyndale, 8 vo., xiii + 329 pages, with sixteen illustrations, map and index. John Murray, London, England, 1932. 10s 6d.

This is the first English translation from the third German edition edited by Ernst Jenny. Christian Klucker was a great gentleman as well as a famous guide, his ascents numbering more than 3,000, inclusive of more than a hundred expeditions, the last of which took place in his seventy-fourth year.

His memoirs surpass anything which individual guides have hitherto written of their exploits, covering as they do his whole life, together with his relations with such outstanding climbers as Norman-Neruda, Whymper, Davidson and Farrar, to mention only a few of those with whom he travelled.

To Americans, much of interest will be found in the chapter dealing with Edward Whymper's expedition to the Canadian Rocky Mountains in 1901, throwing much new light on the chronology of this strangely-conducted journey. Indeed, for Klucker's personal opinion of Whymper, one should consult the original German text, which has been toned down considerably in translation for British consumption.

More than anything previously published, this chapter outlines the progress of their activity in the Rockies, the mountaineering portion of which may be summarized as follows:

June 9th-18th. Banff. The guides, in two separate parties, without their chief, ascended Mt. Rundle, Cascade Mountain, and a peak of the Sawback Range.

June 24th-26th. Vermilion Pass. Reconnoitring for Mt. Ball; attempt abandoned. Ascended two peaks of the Vermilion group, one of which may have been the present Storm Mountain.

July 6th-15th. Lake Louise. Placed camp on saddle between Mts. Whyte and Niblock. Mt. Whyte ascended by Kaufmann, Pollinger and Klucker on July 7th; Mt. Aberdeen by the same party on July 11th. The Mitre was ascended by Kaufmann and Pollinger on July 13th, while Bossonay and Klucker climbed Mt. Niblock. Mt. Lefroy was ascended by Whymper and the four guides on July 15th.

July 25th-August 24th. Little Yoho Valley. Outram joins the climbing party. Mts. President, Vice-President, McArthur, two peaks at head of valley, and Isolated Peak ascended. Klucker and Whymper were not always on these climbs: on August 3rd they crossed Emerald Pass to Emerald Lake; on August 8th, with T. Wilson they traversed Kiwetinok Pass, reaching Field by way of Amiskwi Valley.

The combined group climbed Mt. des Poilus, and on August 17th attained the summit of Mt. Collie. On August 21st, Outram, Pollinger and Klucker ascended Mt. Balfour. Whymper, with assistance, reached the top of Trolltinder, the party afterwards leaving Yoho Valley, Outram, Kaufmann and Pollinger crossed Balfour Pass to Bow River and Laggan. At Field they met Jean Habel returning from his notable journey to Athabaska sources.

On August 26th, Outram and Klucker traversed Cathedral Mountain from Field to Hector.

August 29th-September 7th. Ice River Valley. A short and final journey, to the Ottertail group, came to nothing on account of bad weather, and the party returned to England.

The book, as a whole, presents a varying and always interesting account of the moods of mountains and men: it is a noteworty record which should be widely read.

J. M. T.

Ithuriel's Hour, by Joanna Cannan. Doubleday, Doran & Co., New York, 1932. Pp. 306, with colored illustration and key plan. $2.50.

This novel of a Himalayan first ascent carried out by an English party will intrigue the generality of mountaineers. In many ways reminiscent of Mason's "Running Water" and the Mt. Everest volumes, it paints a strong if ironic picture of a determined and ruthless character whom no difficulty can turn from his objective. As is usually the case with such books, the less said about the moral, both in a mountaineering and in a general sense, the better. The neophyte triumphs while the experienced climbers succumb after getting him over the hard places.

Canadian Alpine Journal, 1931

The 1931 journal of the Alpine Club of Canada sets a high watermark of excellence for this standard publication, now rounding out a quarter of a century of service to American mountaineers. Twenty articles and many valuable notes make up the 205 pages of text, illustrated by fifty-two pages of capital photographs. In the section on mountaineering are ten articles of which four are devoted to climbs and explorations in the Canadian Rockies, three to the British Columbia Coast Range, and one each to the mountains of northern Labrador, the Grand Teton of Wyoming, and the magnificent Southern Alps of New Zealand. The second section, comprising six articles, is devoted to skiing, with one on ski mountaineering, three on winter climbs in the Canadian Rockies, one on skiing near Vancouver, and a winter ascent of Monte Rosa from the Italian side.

A third section deals with scientific subjects related to mountains or mountaineering interests, with one article on glacial fluctuations in the Canadian Cordillera, one on the cypress trees of the mountain skylines, and one on fresh water mollusca in some Jasper Park lakes. The editors should be commended for inserting these scientific articles and thus emphasizing this aspect of mountain exploration. It is the writer's opinion that the pleasure derived from an excursion in the mountains is greatly enhanced by an elementary knowledge of some of the natural phenomena to be encountered. Furthermore, with but slight encouragement, many mountaineers can obtain most interesting and scientifically

valuable data in the fields of geology, meteorology, biology, and botany. Thus the scientific section of a mountaineering journal may have the double purpose of recording observations and at the same time of stimulating further efforts along that line of endeavor.

The last forty-two pages are given over to brief notes of new ascents and expeditions, other alpine notes, new maps, library matters, reviews, and club proceedings and club news. Much of this is of interest to other than club members, especially the section in which are listed the new ascents and expeditions made in Canada during 1931. This, if continued each year, will furnish a most valuable and accessible source of information regarding mountain ascents and will make it possible to bring any future climbing records up to date with less trouble than has usually been the case.

The contents is attractively presented, varied in interest and eminently readable. It will appeal to a wide circle of mountaineers.

W. O. F., Jr.

VARIOUS NOTES

Old and New Helps to the Climber

Notwithstanding feeble protests by a few climbers, mostly of the past generation, hammers, pitons and safety snaps have definitely entered into modern climbing technique. More recently they have been used on ice with excellent results. The notes that follow have no pretense to be complete or new; they are simply offered to inform other climbers of the range of these aids that are available and to present a few particulars regarding their employment.

Notes to Figure 1

A1. Piton hammer; measures 24 cm. in length and weighs 370 gms.

A2. Another piton hammer, of German make, measuring 23.5 cm. in length and weighing 397 gms. The second hammer has the advantage of a hard, sharp point, to open small fissures and facilitate the introduction of the piton in the rock. However, it delivers a less effective blow, and it is more difficult to carry. Type A1 can be easily slipped in one's pocket or safely hung to one's belt; it is made of rather soft steel.

B1. Triangular, soft steel piton, measures 18 cm. in length and weighs 167 gms.

B2. Quadrangular, soft steel piton, measures 15 cm. in length and weighs 166 gms. Both B1 and B2 are provided with a ring and are, therefore, suited for roping-off. They are very strong and because of their thickness they fit only rather large cracks. They are of a type very popular years ago in the western Alps, where they were used mostly to secure permanent cables to rocks.

C1. Simple piton of soft steel, measures 16.5 cm. in length and weighs 115 gms.

C2. Same as C1, but measuring 14.5 cm. and weighing 92 gms. C1 and C2 are inexpensive general utility rock pitons, suitable for roping-off, or for use with safety snaps. They are somewhat thin, but if driven in at least two-thirds of the shaft, they are very secure. They can be easily made by any reliable blacksmith from stock material. They should be driven into the rock with the curved portion upward.

D1. Safety snap (carabiner), 11 cm. long and weighing 135 gms.

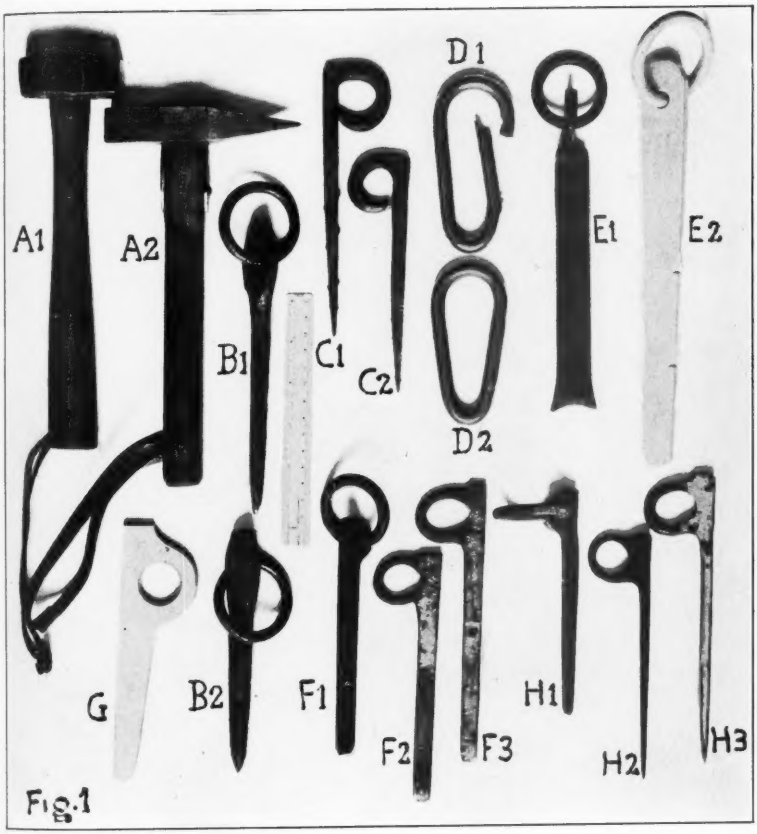
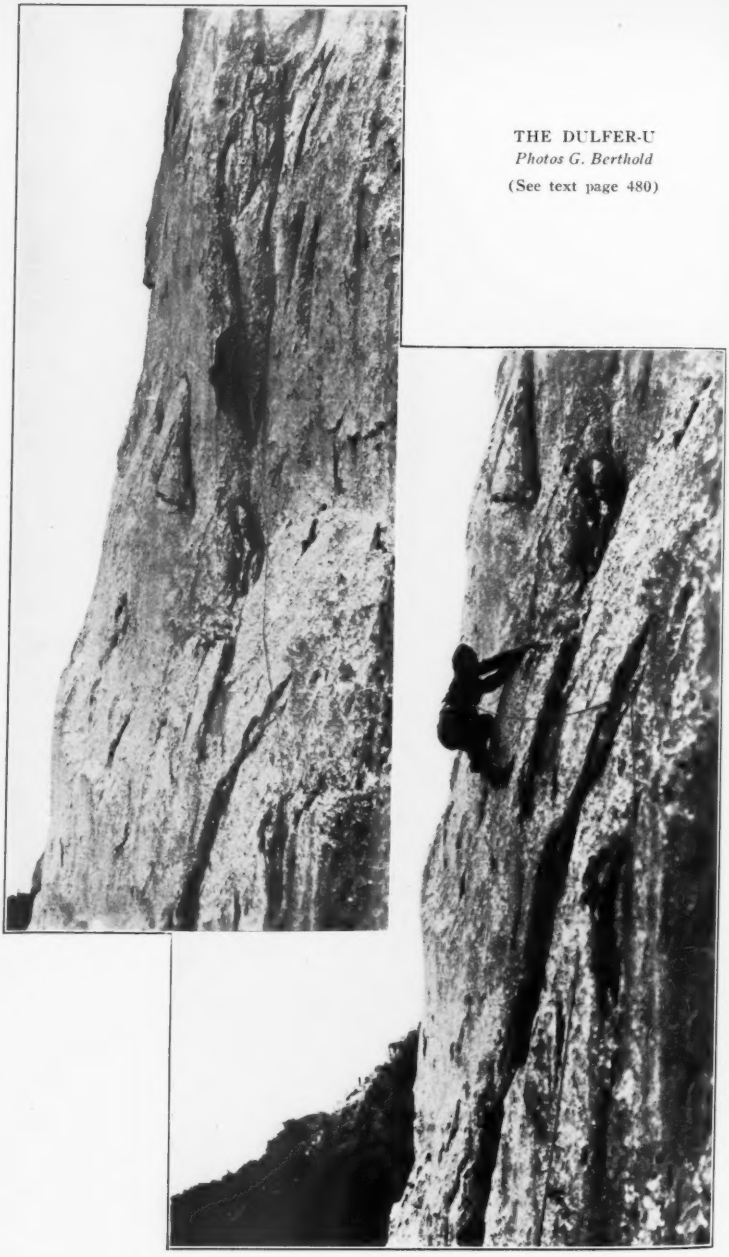


Fig.1



THE DULFER-U
Photos G. Berthold
(See text page 480)

D2. Safety snap, measures 10 cm. in length and weighs 120 gms. These safety snaps are made of hard steel, have a strong spring, and close in a very secure manner. They are inserted in the eye of pitons, and the rope in turn is passed through, thus obviating the necessity of unroping. The last climber of the party recovers them.

E1. An excellent ice piton, of soft steel, with a hardened cutting edge and ring. It measures 19.5 cm. in length and weighs 192 gms. This ice piton is ideal for hard crystalline ice, into which it should be driven transversally, at an angle of about 45°, and up to its twisted neck. It can occasionally be used in large cracks of soft rock. During the past season I used them in ice by drilling a round hole, in which the piton could freely move. With a flip of the rope from below, the piton was easily recovered. Drilling a hole in which the piton can freely move is safer than forcing it in, if the ice is crystalline, because it avoids formation of dangerous and insidious cracks.

E2. Duraluminum ice piton, with ring. It measure 25 cm. in length and weighs 129 gms. By far the best for hard snow, because of its width and length. It should always be driven in full length, at about a 45° angle.

F1, F2, F3. Are soft steel pitons, for vertical fissures on rocks. F1 measure 14.5 cm. in length and weighs 125 gms.; it is provided with a ring to facilitate roping-off. F2 is 15 cm. in length and weighs 98 gms. F3 is 17 cm. long and weighs 104 gms.

H1, H2, H3. Are soft steel pitons for transverse fissures on rocks. H1 is provided with ring and measures 13.5 cm. in length, weighing 109 gms. H2 measures 15 cm. in length and weighs 94 gms.; H3 measures 17.5 cm. in length and weighs 125 gms. Pitons of the F and H type should be driven into the rock with the curved portion downward, so that they can be utilized as footholds. Pitons F and H are by far the best rock pitons, and an assortment such as the one illustrated would meet all the requirements of any grimpeur.

G. A duraluminum piton for rock, 15.5 cm. in length, weighing 62 gms. only. It is recommended as an emergency piton, to be carried as part of a standard equipment.

Articles A2, D, D2, E2 and G are for sale by Ravelli, Corso Ferruccio 70 Turin, Italy. Articles F1, F2, F3, H1, H2 and H3 are manufactured and for sale by Grivel, Courmayeur (Italy), famous maker of ice axes and crampons.

Notes to Figure 2

A relatively new type of sack, provided with a duraluminum tube frame and an ingenious system of straps that bring the weight of the sack well under the arms, rather than giving the customary pull backwards. It also has a wide strap that keeps the sack away from the back, eliminating perspiration. It is provided with a leather belt for strapping in front, thus eliminating dangerous motion of sack on sideway passages. It has two long side pockets and one large posterior. It is of large capacity and weighs 1,820 gms.

Notes to Figure 3

The best ice crampon yet devised, designed and constructed by Grivel, of Courmayeur. It is of the Eckenstein ten-point variety, with two additional prongs, directed forwards.

The advantages of such addition are at once obvious, and on very steep hard snow their usefulness can hardly be overestimated. The lower prongs, instead of being simple points, are made after the fashion of cutting chisels, properly directed. The weight, with linen straps, for the largest size is 1,354 gms. per pair.

The type of nails illustrated in the same figure has proved very good on rough ground such as one encounters in the Canadian Rockies, although they are heavier and less efficient than an all-triconi boot.

Notes to Figure 4

The best Klettershue are made of stout but light waterproof cloth and light leather. The soles are of soft cloth, closely and securely stitched. They should very closely fit the foot and the soles should not advance outside the foot margin. This type originated and is universally employed in the Dolomites (Scarpette-Scarpa da gatto). Climbing shoes with crepe-rubber soles or rope soles are also good but should be considered second choice.

The ice-axe strap illustrated in Figure 4 is of great utility. It is made of a linen strap, secured to a steel ring which fits loosely around the wooden shaft. An iron nail, of the type used for climbing shoes, is fixed in the shaft, about 30 cm. from the tip. The strap easily running up and down, can be used to carry the ice-axe while rock climbing as well as to secure it to the wrist while step-cutting. Some climbers, instead of the nail, use a leather ring nailed around the shaft; this has the disadvantage of retaining moisture, thus producing in time a weak spot in the shaft.

Notes to Figure 5

This nail is the latest contribution to rock-climbing by a group of Courmayeur guides. It is devised to be used on solid granitic

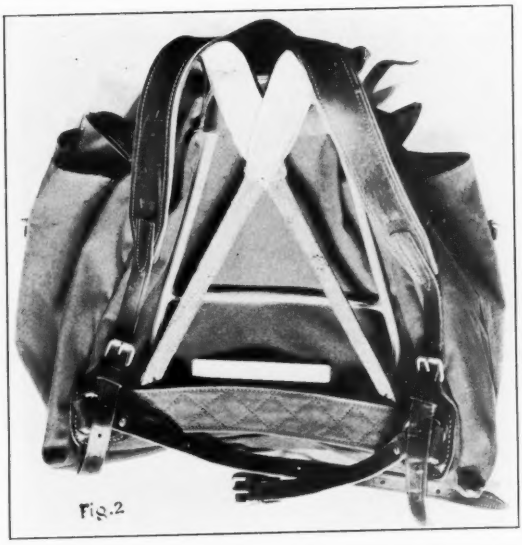


Fig.2

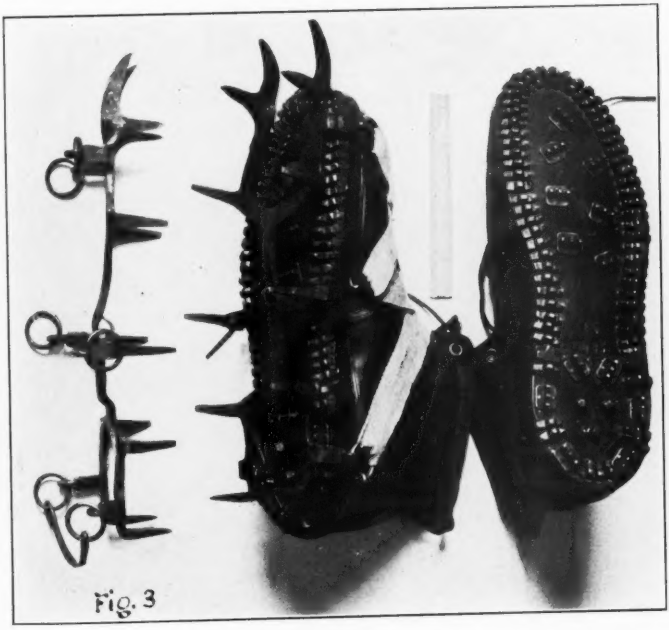


Fig. 3

Fig.4

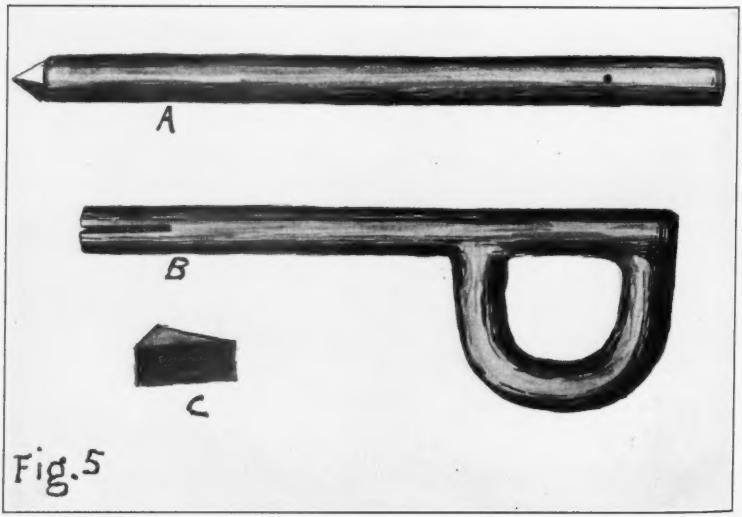


Fig.5

rock, where no natural cracks are to be found. A hole is first drilled in the rock, using a round chisel (*a*) with a hard-steel point. This chisel is pierced with a hole, so that it may be secured to the wrist of the operator by a stout string.

The hole in the rock should be 5 to 8 cm. in depth, and when finished, the special piton (*b*) is introduced in it, after the wedge (*c*) has been lightly fitted into the cut at the end of the piton. This is then hammered into the hole, where it will be securely retained by the forced expasion of the wedge. This spike, prepared by Grivel, made possible such feats as the ascent of the vertiginous Père Eternel and the S. ridge of the Aiguille Noire de Péteret. The piton measures 15 cm. in length and weighs 110 gms.

MAX M. STRUMIA.

A HIGH-LEVEL GLACIER ROUTE FROM JASPER TO FIELD

One of the features of classical mountaineering in the Alps was the development of the high-level route between Chamonix and Zermatt. As originally laid down by Jacomb,[1] in 1862, this required four days of actual climbing as follows: (1) Lognan to Orsières (Col d'Argentière). Orsières to Burg St. Pierre (the "intermediate link"). (2) Bourg to Chermontane (Col du Sonadon). (3) Chermontane to Arolla (Col de Chermontane). (4) Prarayen to Zermatt (Col de Valpelline). As topographical knowledge increased certain alterations were made and variants became customary.[2]

Believing that it may prove suggestive to outline a comparable line of travel across Canadian snowfields, I present as a possibility a way across névés of the main watershed from the head of Athabaska River to Field. Much of it is over ground already trodden, but short connecting links must still be worked out and may appeal to climbers who are young and active.

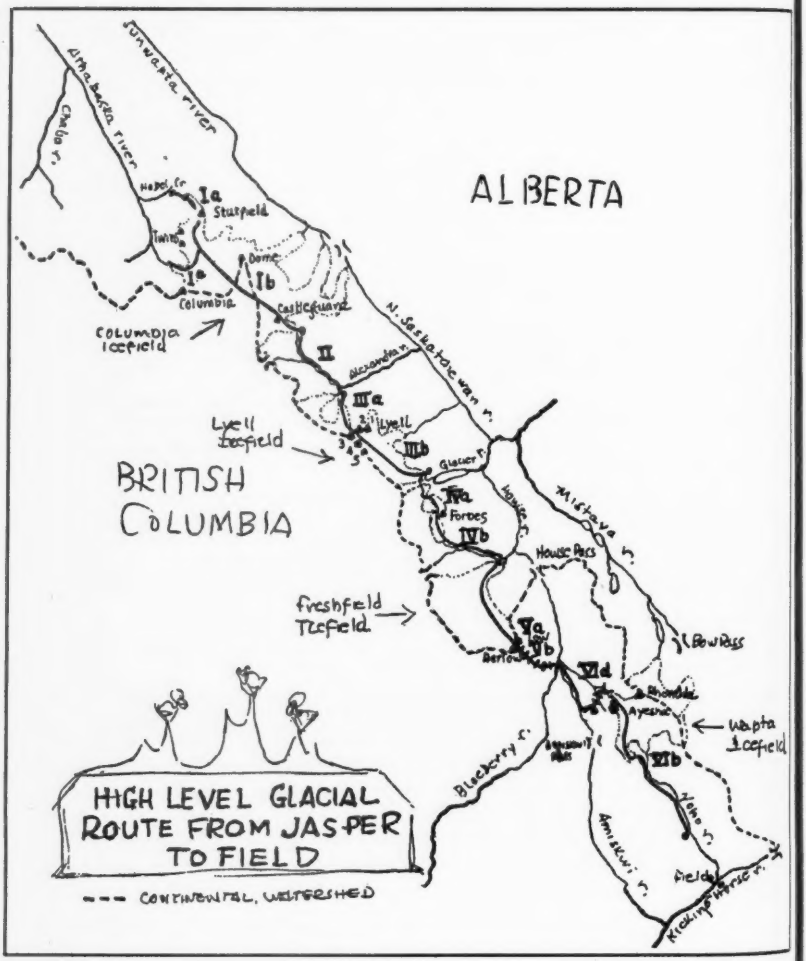
From Jasper to the head of Athabaska River four days with horses will be required. Then follows:

(1) *a*. To the Columbia icefield. By the only route through which this has been accomplished from the Athabaska valley, the Columbia glacier and the broken cliffs southeast of The Twins were ascended, a way that has little to recommend it,[3] although possibly it could be improved upon. A more feasible line is opened if a satisfactory route can be found to the col immediately north of Mt. Stutfield (11,880 feet), between this peak and the unnamed peak (10,900 feet) to the north. Once this is attained the northern slopes of Mt. Stutfield may be ascended, the mountain traversed and the Columbia névé attained.

The route to this objective col north of Mt. Stutfield has yet to be worked out. If the valley of Habel Creek is used, the stream,

as well as the retreating glacier north of North Twin, will be found difficult to cross, and it will be necessary to place a bivouac at the head of the valley.[4] An alternate and possibly better route might be made from the Sunwapta side.[5]

b. The icefield is crossed in a southeasterly direction, between Mt. Columbia and Snow Dome, skirting the northeast side of Mt. Castleguard to reach Castleguard meadows.[6]



(II) From Castleguard meadows down Castleguard River to the Alexandra glaciers, an "intermediate link." [7]

(III) *a.* The southern division of the Alexandra glaciers is ascended to the Lyell icefield, crossing through the 2-3 col (11,000 feet), which is the easiest of any of the depressions between the Lyell peaks.[8]

b. Descend Lyell icefield to the southeast Lyell glacier and reach campground in the valley of Glacier River.[9]

(IV) *a.* Ascend Mons and North Forbes glaciers to Forbes glacier to the col (10,200 feet) immediately west of Mt. Forbes.[10]

b. Descend South Forbes glacier to Forbes Brook and follow trail to campground at tongue of Freshfield glacier.[11]

(V) *a.* Ascend Freshfield glacier and icefield to the Low-Barlow saddle (9,600 feet).[12]

b. Descend to Blaeberry River to reach trail from Amiskwi pass. An untried section, involving descent of Cairnes glacier or its bounding ridges.[13]

(VI) *a.* From the trail to Amiskwi pass cross north of Ensign East (8,294 feet) and traverse slopes to Ayesha glacier and

1. F. W. Jacomb, *et al.*, "The High Level Glacier Route from Chamonix to Zermatt," Peaks, Passes and Glaciers, i, second series, 1862.

2. A. B. W. Kennedy, "The High Level Route," *A. J.*, xxiv, 85.

3. The route of A. J. Ostheimer in 1925 (*C. A. J.*, xvi, 19).

4. Observations by E. Cromwell and J. M. Thorington from the slopes of "Little Alberta" in 1931. Habel Creek was first visited by Jean Habel, in 1901, who attained the Athabaska-Sunwapta divide at that time (*App.*, x, 28). His "Horseshoe" glacier, entering the valley from the slopes of North Twin, has subsided considerably in the intervening thirty years, leaving irregular steep hummocks of terminal ice that are difficult and tedious to cross.

J. W. A. Hickson and H. Palmer camped in the valley in 1924 (*A. J.*, xxxvii, 315; *App.*, xix, 245, 400), as did also the Japanese party led by Y. Maki in 1925 (*A. J.*, xxxvii, 316, 374; *App.*, xix, 246, 408). Neither of these parties attempted any climbing on the south side of Habel Creek.

5. The route of J. N. Collie, H. E. M. Stutfield and H. Woolley on the ascent of Mt. Diadem in 1898 (*C.*, 123); and of W. R. Hainsworth, J. F. Lehmann, M. M. Strumia and N. D. Wafflard to the Unnamed Peak, 10,700 feet, in 1930 (*A. A. J.*, i, 308).

6. The Columbia icefield was attained in 1898 by Collie's party, from the head of the Sunwapta, by way of Athabaska glacier, in ascending Snow Dome. It was reached from Castleguard River in 1902 by Outram, when Mt. Columbia was climbed. The field was crossed from Castleguard meadows in 1923 by W. S. Ladd and J. M. Thorington in reaching North Twin (*A. J.*, xxxv, 191; *C. A. J.*, xiv, 40). The latter crossing falls into the route now being outlined.

7. There is a good trail from Castleguard meadows to the head of Castleguard River opposite Thompson pass. Travel is chiefly on the eastern side of the valley, although horses use the gravel islands of the river.

8. Campground is on the south side of the river, several hundred yards below the glacier tongues. Mt. Lyell (Pk. 2) was ascended from this point by Outram in 1902 (*App.*, x, 142), and the basin of the southern Alexandra glacier was again attained by W. S. Ladd and J. M. Thorington in 1923 (*A. J.*, xxxv, 188). The Lyell 2-3 depression was crossed by A. J. Ostheimer, M. M. Strumia and J. M. Thorington in 1926, in making a circuit of Pk. 3 (*A. J.*, xxxix, 58; *C. A. J.*, xvi, 142).

Ayesha-Rhondda col (8,800 feet). This involves a short untried section of no apparent difficulty.[14]

b. Descend Wapta icefield in a southeasterly direction, crossing the Collie-Yoho col (9,000 feet) to Twin Falls cabin and Takakkaw camp.[15]

While such a route may seem audacious at the present time, the writer has no hesitation, having personally been on or looked over every bit of this ground at various times, in saying that, with proper arrangements, it is a perfectly feasible program, presenting no extraordinary mountaineering difficulties.

Indeed, if the region had been an inhabited one, as in the Alps, there is no doubt but that most of this high-level route would have been known to peasants of the eighteenth century. A chain of huts uniting the composite elements of the route would be of great value, and is to be hoped for in future time.

Nothing has been said as to the possibility of ascending peaks on the way, but numerous attractive summits are at hand and will be known to those who give careful attention to the various

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9. The Lyell icefield was reached in 1902, from the valley of Glacier River, by the party of J. N. Collie. The icefield was not completely traversed. In 1926, from a bivouac above the Southeast Lyell glacier, the icefield was crossed by A. J. Ostheimer, M. M. Strumia and J. M. Thorington during various ascents of the Lyell peaks (*A. J.*, xxxix, 52 ff.). Unless horses are available for crossing Glacier River, camp is best made on the north side of this stream.

10. Mons glacier and névé were first traversed in 1902 by Outram during the ascent of Mons Pk., which was made direct from the valley of Glacier River (*App.*, x, 209). From a high bivouac on the western margin of Mons glacier, the North Forbes glacier was first explored in 1926 by A. J. Ostheimer, M. M. Strumia and J. M. Thorington, during an ascent of Mt. Forbes from the valley of Glacier Lake (*A. J.*, xxxix, 65).

11. The west col of Mt. Forbes and the South Forbes glacier were first visited by Collie's party in 1902, during the descent of Mt. Forbes (*A. J.*, xxi, 370). The west side of the glacier should be avoided because of crevasses (*C. A. J.*, xii, 36). There is a good trail from Forbes Brook to the Freshfield tongue, on the west side of the Freshfield stream.

12. The Freshfield glacier was ascended by Dr. Hector in 1859, and the slopes of Mt. Freshfield by Collie's party in 1897. The extreme southeastern head of the Freshfield névé was attained, in 1930, by O. E. Cromwell and J. M. Thorington during ascents of Mts. Barlow and Low (*A. J.*, xliii, 79).

13. The 1930 party on Mt. Barlow could see nothing that would prevent this.

14. The Blaeberry trail has been known since the opening of Howse pass by David Thompson in 1807. The branch to Field across Amiskwi pass was laid down by Collie and Baker in 1897. The Ensign stations of the Boundary Commission were made in 1917, the eastern being revisited by H. Palmer and J. M. Thorington in 1922 (*A. J.*, xxxiv, 390). The Ayesha-Rhondda col was attained in 1930 by O. E. Cromwell and J. M. Thorington during the ascent of Mt. Ayesha (*A. J.*, xliii, 80).

15. Portions of the Wapta snowfield have been crossed since 1897 (for its mountaineer passes and their history see *A. A. J.*, i, 405). Descent from the Ayesha-Rhondda col to Twin Falls and Takakkaw camp was made in 1930 by O. E. Cromwell and J. M. Thorington (*A. J.*, xliii, 80).

papers mentioned in the footnotes. Needless to say, the maps of the Boundary Commission should be thoroughly studied.

A climbing party, working out and carrying through such a program, will deserve great credit and, in addition, will store up unforgettable memories of all that is grandest in the scenery of the Rockies of Canada.

J. Monroe Thorington.

Aiguille Savoie (11,900 Feet)

(Second ascent of the southeast ridge, descent by the southeast face)

The first ascent of this ridge was made by Paul Preuss, solo, August 13, 1913, in four hours, from the Triolet hut.[1]

On August 13th, 1931, our party reached the Triolet hut of the C. A. I.[2] from Savojan in two hours and a half. The hut was left at 3 A.M. next day, and following the moraine and glacier, the party reached the base of the ridge at a height of about 10,660 feet. The climb is up open chimneys and very steep placques of solid rock, sometimes along the ridge (gendarmes), sometimes a little to the right of it. The ascent is very interesting and of moderate difficulty.

The summit was reached at 8.15 (five hours and fifteen minutes from the hut) and the descent was begun at 8.45, amidst an extremely violent snowstorm. The southeast face was traversed diagonally, and in the last portion the couloir descending from the Col de Talèfre was followed. This appears to be subject to stone fall. The bergshrund was wide and high, and had to be jumped. Return to the hut at 1 P.M.

The party was made of two ropes, the first with Evaristo Croux, guide, and Max Strumia; the second with Francesco Ravelli, Abrate and Passerin D'Entrèves.

Max M. Strumia.

Mt. Chancellor (10,761 Feet)—Canadian Rockies

The second ascent of this peak was made by Miss Georgia Engelhard with the Swiss guide, Ernest Feuz, on July 24th, 1931, almost exactly thirty years after the first ascent by Sir James Outram and party. Leaving Wapta Falls Camp near Leanchoil at 2 A.M. by car, they arrived at the base of the mountain about four. In three hours of steady going through timber they attained an elevation of about 6,500 feet near the spot where Outram

[1] *Rivista Mensile*, C. A. I., Turin, 1914, p. 336.

[2] 8,486 feet—in miserable condition, will probably be reconstructed higher up in 1932 or 1933.

bivouacked. They then took to the steep rock of the great southwest arête, far to the left of the gully utilized by Outram. For two hours they climbed up steep bluffs and along a narrow ridge of extremely rotten rock with great drops on each side. At 9,000 feet they were forced to traverse right over slabs with scant holds and no anchorages, using the greatest care. The traverse was three rope-lengths wide and they used sneakers. Thus they attained another arête which brought them, after an hour of hard climbing, to the main southwest arête of the mountain, which proved to be long and much be-pinnacled. At 12.30 P.M., after 8½ hours of almost constant climbing, they gained the beautiful corniced summit.

They found Outram's record, quite by accident, written upon a torn and weatherworn paper. Only the names of Outram and Christian Häsler remained and the date of their ascent. The names of Messrs. Weed and Scattergood had been obliterated by the elements, their being no bottle or tin container. They remained on the summit one hour, the weather being fine, though smokey in the distance. After building a cairn next to the cornice and leaving their names in a small tin box, they descended in four hours by Outram's route of ascent. Care was needed on slabs coated with hard frozen snow near the summit, but once in the gully, glissades took them rapidly down to a belt of bluffs, which necessitated a traverse to the right, somewhat uphill. This conducted them to grassy ledges by which they descended to timber and the road at 5.30 P.M., total climbing time 12½ hours.

Habel-Collie Traverse. The same party ascended Mt. Habel by the usual route from Twin Falls Chalet. They descended its north face on very steep fresh snow to the Habel-Collie col, which seemed to present an easy route to Mt. Collie. However, they soon encountered a series of huge ice-falls and were forced to descend some 2,000 feet in the direction of Habel névé. Passing through numerous crevasses, they attained the scree slopes which lead to the south rock arête and thence the summit. The rock arête presented an unfavorable stratification. The snow to the right was too soft for use, although later in the season it would have afforded an easy route.

GEORGIA ENGELHARD.

*

MT. OUBLIETTE (10,100 FEET)
(First Ascent)

This peak of the Ramparts in Tonquin Valley was ascended for the first time July 27th, 1932, by Max M. Strumia and William R. Hainsworth accompanied by the Swiss guide Hans Fuhrer. Leaving Memorial Cabin on Penstock Creek at 2.30 A.M. they crossed Para Pass and traversed ledges of Paragon Peak to the col between Oubliette and Dungeon peaks. From there they

Photo G. Engelhard

MT. CHANCELLOR FROM MT. VAUX

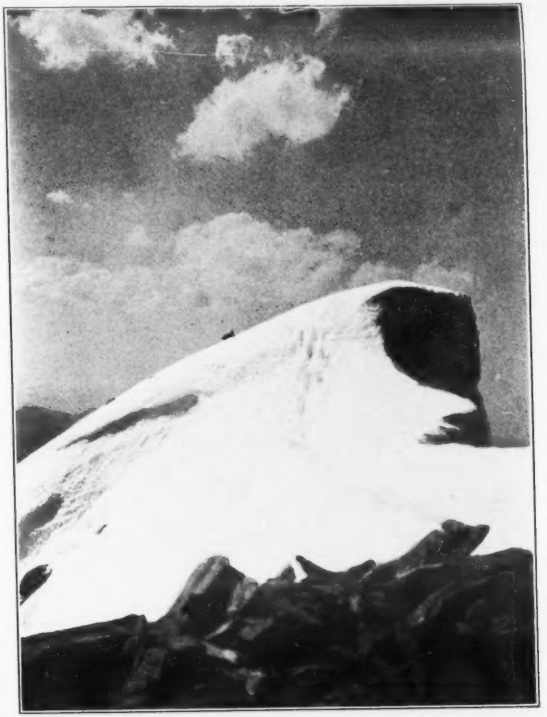

Photo G. Engelhard

SNOW SUMMIT OF MT. CHANCELLOR

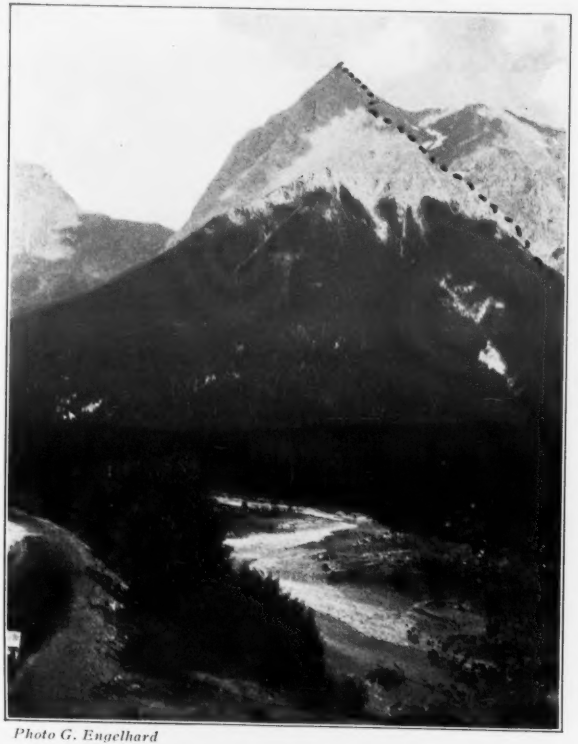

Photo G. Engelhard

MT. CHANCELLOR FROM MOTOR ROAD SHOWING ROUTE OF ASCENT

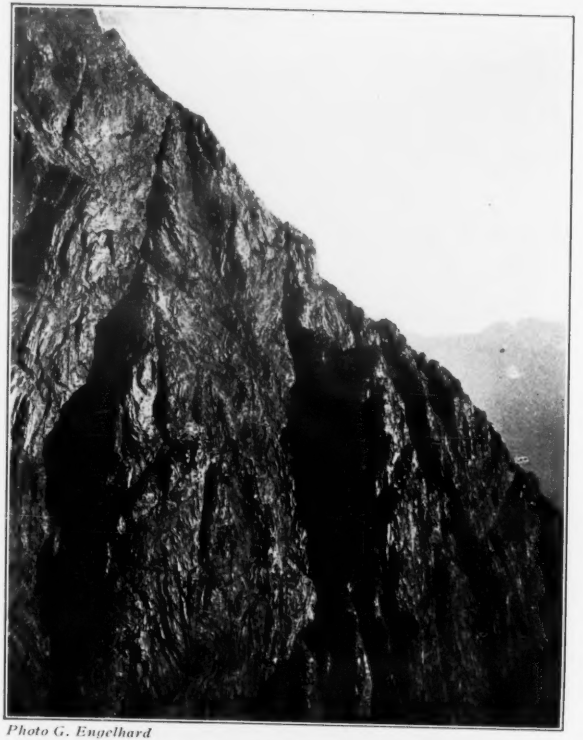

Photo G. Engelhard

RIDGE OF MT. CHANCELLOR BY WHICH ASCENT WAS MADE

attacked the ridge but after some very difficult crack climbing and traverses they encountered a vertical pitch of 100 feet with an overhang which took two hours for the leader to overcome. At this juncture, a storm broke upon them and lightning hit the crags above, so they were forced to desist. Avoiding some of the earlier difficulties by roping off, they made their way back to the hut at 1 A.M. Next day they returned to the attack leaving camp at 3 A.M. They traversed ledges on both Paragon and Oubliette loaded with fresh snow and finally gained a point near the col between Oubliette and Dungeon. Very steep climbing with pitons and a 10-foot roping off into a notch where they left the rope, brought them to a ledge which they traversed back to the Paragon side of the peak. They were now above the 100 foot vertical pitch and succeeded in gaining the summit at 3.30 P.M., but the melting new snow made the return by their morning's route too risky, so they roped off down the 100 foot pitch. This took one hour. The return to camp was effected at midnight. They report the climb as the most difficult made by them in the Rockies and surely one of the most difficult of the whole chain.

The 1931 Mountaineering Season in Grand Teton National Park

The popularity of the Tetons has reached a point where it is something of a problem to keep tab of all the ascents made each season, but through the zeal of the national park rangers stationed at the Jenny Lake Station (the starting point for most expeditions) a climbing record was kept for the summer of 1931 which is believed to be complete.[1] According to the 1931 Log Book kept by the ranger staff, the season opened on June 22nd with a traverse of Teewinot and closed on October 4th with an ascent of the Grand Teton. Both of these dates are late as compared with previous years. In the log may be found entries relating to fifty-seven successful ascents—a remarkable record in view of the fact that it is necessary to go back into the history of the Tetons only ten years to find a season when throughout the entire range not a single ascent was made.

Climbing conditions were excellent. The light snowfall of the preceding winter was followed by a summer of unprecedented drouth and heat, and men who have lived in the Jackson Hole country for nearly forty years state that they have never seen the snow in the Tetons reduced to such an extent as in the summer just past.

All of the major peaks having been conquered, the emphasis of climbers in 1931 turned to traverses and the accomplishment

[1] I am indebted to Ranger Phil Smith for a record of the ascents made subsequent to August 20. Credit is particularly due to Smith for the accurate check that was kept of 1931 ascents. F. M. F.

of new routes. Efforts in these fields were eminently successful, and from the fact that eighteen new routes were worked out on major peaks alone one may infer that much original climbing of a high order took place. As in previous years the Grand Teton was the center of interest, the more so since for the first time authorized guide service was available; but a significant feature of the season is to be found in the wide distribution of the climbs, every major peak but one (Mt. Woodring) being scaled at least once in the course of the summer. As in other recent years, solitary climbing was in vogue, and it is interesting to note that now—at the close of 1931—all of the major peaks have been scaled by solo climbers. The minor peaks came in for some attention, four being climbed for the first time. A noteworthy feature of the 1931 season was the unusually large proportion of foreigners among the climbers. Their visit to the region may be taken as indicative of the interest in the Tetons which is developing abroad.

A report on the nomenclature of the Grand Teton National Park, prepared by the writer in 1930 and subsequently, with slight modification, approved by the National Park Service, was adopted by the United States Geographic Board on June 3rd, 1931.[2] As a result of this decision, over sixty place names—the majority of them new—were given official status.

A project begun in 1929 by Ranger Phil Smith and the writer, calling for the placement of standard bronze register tubes and register books on the Teton peaks, was completed on August 18th when the last of the sixteen available tubes was placed on the summit of Mt. Owen. All of the major peaks are now so equipped, as well as several of the more accessible lesser ones. The tubes are of the type used in Rocky Mountain National Park, Colorado; the register books are of a new loose-leaf type which has thus far proven very satisfactory. As the permanent registers were placed on the summits, the mountaineering records to date were entered in them and all original records were brought down to the office of the park superintendent for safe keeping, and the original containers from which they were taken, a motley assortment of tins and bottles, were placed on display in the park museum.

A review of the season's climbs, peak by peak beginning at the south end of the range, follows:[3]

THE MAJOR PEAKS

Buck Mountain (11,400). First traverse on August 15th, by the writer. Ascent from south fork of Avalanche Canyon by

[2] "Decisions of the United States Geographic Board, No. 8, Decisions Rendered June 3, 1931," Washington, 1931. Five pages.

[3] For more detailed description of the new routes of 1931 see articles in *Appalachia* for December, 1931, and June, 1932.

northeast ridge; descent by old route (east face). Register placed on summit. The route of ascent was the first new one on Buck Mountain, so far as known, since the first ascent in 1898.

Mt. Wister (11,000). Climbed on June 27th by Ranger Phil Smith. Ascent from southeast, from south fork of Avalanche Canyon (new route). Descent by same route.

First traverse on August 16th, by the writer. Ascent from south fork of Avalanche Canyon by southwest ridge; descent into north fork of Avalanche Canyon by northwest ridge (both routes new). Register placed on summit.

Nez Percé (11,700). First traverse on July 12th, by Robert L. M. Underhill and the writer. Ascent made from east (new route) and traverse of all four summits. Descent by west face.

First solo ascent on August 22nd, by George E. Goldthwaite. Ascent and descent by west face (see South Teton and Middle Teton below).

South Teton (12,500) and Middle Teton (12,769). Middle Teton traversed on July 17th, by Robert L. M. Underhill and the writer. Ascent by north face (new route); descent by southwest ridge and southwest couloir.

On August 22nd George E. Goldthwaite scaled Nez Percé as noted above, continued to the head of the south fork of Garnet Canyon, climbed the South Teton (the only 1931 ascent of this peak) and returned by the northwest ridge, and, finally, traversed the Middle Teton, ascending it from the south and descending by the east face and south gully (the portion of this route through the south gully being new).

Grand Teton (13,747). Climbed by twenty-six distinct parties, a total of seventy-six signatures being registered on the summit (seventy-one men and five women). Authorized guide service offered for the first time, Paul K. Petzoldt serving as guide and conducting eleven parties to the top.

Nineteen of the twenty-six ascents were by the Owen route; six were traverses, using the Owen route on the descent; one made use of the Owen route greatly modified on both ascent and descent. To the two routes previously available, no less than four new ones were added this season:

On June 27th Hans Wittich, Rudolph Weidner, and Waldo Peeker scaled the west wall above the upper saddle by a 120-foot chimney, thus introducing a "short cut" in the Owen route and dispensing with the famous "Cooning Place" previously used on all ascents from the west. Their return to the upper saddle was again made by the west wall, a little to the south of the 120-foot chimney.

On July 15th the Grand Teton was simultaneously climbed from different directions by three parties which met on top: (1) Paul Petzoldt and Mr. and Mrs. Fred Wittenberger by the Owen route; (2) Glenn Exum by the westerly of the two south ridges; and (3) Robert L. M. Underhill, Ranger Phil Smith, and Frank Truslow by the easterly of the south ridges. Neither of the south ridges had previously been climbed. A ledge previously discovered by Petzoldt was used by Exum in gaining the south ridge. This ascent was particularly noteworthy since it was made alone and by a practically inexperienced and unequipped climber. In descending the peak Petzoldt similarly cut over to the south ridge and, approximately repeating Exum's route, returned a second time to the summit. Since then two parties have climbed the peak by Exum's Ridge, and this route promises to rival the traditional one in popularity.

On July 19th Robert L. M. Underhill and the writer climbed the Grand Teton from the only side which remained unconquered, the north face (see account elsewhere in this JOURNAL).

Mt. Owen (12,910). Climbed by four parties, none of which followed throughout its entire length the route employed on the two previous ascents of this peak (1930) though all utilized the last portion of it (the west fissure) in scaling the Granite Knob.[4]

On July 20th Theodore and Gustav Koven, Paul Petzoldt, and Glenn Exum reached the base of the Knob by traversing the southeast face of the peak by the upper bench (new route). Descent was by the same route.

Petzoldt made his second solo climb of this peak on August 7th, reaching the Knob from the northeast by way of Cascade Canyon (new route). Descent was by the route of July 20th.

On August 16th Dallas E. Conniff and A. William Fricke repeated the route of July 20th, both on the ascent and descent.

Ranger Frank Smith and the writer traversed the peak on August 18th, reaching the base of the Knob by climbing the southwest arête from the edge of Gunsight Notch (new route), and descending by the route of July 20th. A register was placed on the summit.

Teewinot (12,100). Among the seven 1931 ascents of this peak were two traverses which involved new routes:

(1) Ranger Frank Smith and the writer made a west-to-east traverse from Teton Glacier on June 22nd (first ascent from the west).

(2) On July 4th Theodore Anderson, Rudolph Edmund, Harold Hendrickson, and the writer climbed the peak by the usual

[4] See account of first ascent of Mount Owen, *American Alpine Journal* for 1931, page 324.

route (east face) and made a descent through northwest couloirs to the floor of Cascade Canyon (new route).

Carl Sampson, H. L. McClintock, and his son, Frank, climbed Teewinot on July 27th, giving Frank (aged ten) the distinction of being the youngest climber to have scaled a Teton peak. Mrs. Fred Wittenberger of Vienna, who climbed Teewinot on July 12th with her husband, is the only woman to have registered on this summit.

Mt. Moran (12,100). Five ascents in 1931, of which the following call for mention:

First ascent from the southeast (by the "dike route") on June 23rd by Hans Wittich and Otto Stegemaier. Descent by the same route.

Register placed on summit on July 17th by Theodore and Gustav Koven and Paul Petzoldt (route: the northeast ridge).

Traverse of the peak on July 24 by Robert L. M. Underhill and Paul Petzoldt, involving first ascent of the east face and descent by the "dike route."

On August 24th George E. Goldthwaite, Paul Petzoldt, Lee Doud, and Earl Bowman made a swift traverse of the peak, ascending it by the northeast ridge and descending by the east face (first descent by latter route).

THE MINOR PEAKS

First Ascents

Cloudveil Dome (12,000). East-to-west traverse on July 21st, by Anderson Hilding and the writer. Continuing westward, a traverse was made of the ridge extending from Cloudveil Dome to the South Teton, and five additional minor summits were visited.

Storm Point (10,100). Traversed on August 13th, by Ranger Frank Smith and the writer. Climbed from east and north; descent made toward west and southwest into Cascade Canyon. The sharp needle between Storm Point and Symmetry Spire was also traversed.

Nameless Peak (11,000). On June 23rd Carl E. Sampson, H. L. McClintock, and Frank McClintock (aged ten) climbed a peak due west of Mt. St. John ("indicated by the 11,000 contour circle which makes a dot for the I in 'National' ").

East Horn of Falling Ice Glacier (11,400). Traversed on July 31st by the writer. Ascent by south ridge; descent by east side.

Other Ascents

Symmetry Spire (*10,500*). First traverse and ascent from west on July 13th, by William Cederberg, Rudolph Edmund, Leland Horberg, Neumann Kerndt, Elof Peterson, and the writer.

Gratification Peak (*11,600*). Register placed on summit by writer on July 16th. Probably other unreported ascents of this easy peak were made later in the summer.

FRITIOF M. FRYXELL,
Grand Teton National Park.

♣

Mt. Kamet: An English expedition led by Mr. Frank S. Smythe successfully assaulted this Himalayan peak (25,447 feet) and effected two ascents of the world's highest yet climbed summit. It was favored with good weather conditions and like several other recent expeditions to the Himalaya used skis to great advantage. On June 21st, 1931, Messrs. Frank S. Smythe, E. E. Shipton, R. L. Holdsworth and the porters Lewa and Nima Dorji reached the top and were followed two days later by Capt. E. St.J. Birney, Dr. R. Green and the porter Kesar Singh.

♣

Kangchenjunga: The Bavarian expedition under Paul Bauer, which last summer attempted to avenge their defeat by the weather two years ago on Kangchenjunga, again conquered almost superhuman difficulties only to find their way barred at 26,000 feet. After battling for several months with the tremendous ice walls, towers and battlements of the northeast spur and losing two men in a most unfortunate accident (the young Vienese, Hermann Schaller and the porter Passang), they were repulsed in September by the bad state of the short (400 feet) but very steep slope leading to the north ridge, which according to their observations would have led them without difficulty to the summit. As it snowed every day, there was no hope of improvement and a retreat was necessary, a most unfortunate end to a heroically conceived and executed mountaineering enterprise.

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Khan Tengri: A Russian expedition of last summer, under the leadership of a Mr. Pogrebezki succeeded in accomplishing the ascent of this peak, the highest summit of the Tien Shan, and confirmed the accuracy of Merzbacher's determination of its altitude, his figure of 23,622 feet having been at one time declared too high. It is, therefore higher than Mt. Kaufmann (Lenin Peak), 23,391 feet, in the Trans-Alai, and is only surpassed by Garmo, *ca* 24,605 feet (25,000 feet according to some authorities) in the Seltau Range.

Himalayan Expeditions: There are at present several expeditions under weigh, one of which contains several American members. Herr Willi Merkl of Munich left at the end of April with a large party to attempt Nanga Parbat (26,629 feet), the trip having been postponed from last year. The other members of the party are F. Bechtold, H. Künigk, F. Wiessner, F. Simon, P. Aschenbrenner, H. Hamberger (doctor), with E. Rand Herron and Miss Elizabeth Knowlton of the American Alpine Club.

Current dispatches indicate that the party is operating on the Rakiot glacier and aims to pass to the left of Rakiot Peak towards the main summit. Camp Four has been established at 20,000 feet on the glacier. Avalanches have been frequent and dangerous. Snow caves are being utilized for protection. By August 8th they were encountering much unfavorable weather, although it had been excellent through July, and the health and strength of the climbers were suffering from their exertions. Coolies had been taken to Camp Six but the party realized that they cannot be counted on any higher.

Mr. Marcel Kurz, who accompanied the 1930 Dyhrenfurth expedition to Kangchenjunga as topographer has left on an exploring and surveying expedition.

Kamchatka: It is reported that the highest summit on the island, Kluchevskaya (16,124 feet), has been recently ascended by two Europeans after a long expedition.

Ruwenzori: A group of Belgians under the leadership of Count Xavier de Grunne, with mountaineering and scientific aims, has left for the exploration of this range, and will approach the mountains from the Belgian Congo on the practically unknown west side.

Mikeno: We hear that our honorary member, His Majesty, the King of the Belgians, has recently during his tour of the Congo, attempted the ascent of this volcanic peak, 14,350 feet high, north of Lake Tanganyika. The party consisting, in addition to His Majesty, of Major Van Caubergh, Professor Van Staelen, Colonel Hoeir, the District Commandant Hackers, and the Catholic Missionary Hoes, reached on April 13th the height of 13,940 feet, before being turned back by a sheer wall.

Andes: A new German expedition, financed by the Deutscher und Österreichischer Alpenverein and led by Philipp Borchers, the leader of the mountaineering group of the 1928 Russo-German Alai Expedition, has left for the exploration of the Cordillera Blanca in Peru. We hope that the members of the expedition

are better informed on the accomplishments of Miss Peck on Huascaran, the highest peak in the group, than the editor of one German mountaineering periodical, who asserted that she had made a "romantic but unsuccessful attempt" upon the peak! It is planned to spend about six months on the trip, and the base of the expedition is expected to be at Yungay in the upper Santa Valley. The purposes of the expedition are stated to be: mapping (especially a map 1:50,000 of the vicinity of Huascaran), glaciology, hydrography, botany, measurements of cosmic rays and cinematography. As we go to press, reports state that the highest summit of Huascaran has been ascended by members of the expedition.

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San José: The highest summit of this mountain (19,284 feet) in the Chilean Andes was ascended for the first time by Sebastian Krückel and Otto Pfenniger of Santiago on March 6th, 1931.

♣

Caucasus: The projects of two Swiss climbers, Messrs. Mägglin and Heglin, came to an abrupt end with their disappearance on July 26th, 1931, together with two Russians, while they were attempting the first ascent of the Misses Tau. Their sleeping-bags were found several weeks later by a group of Vienese (Karl Poppinger, Karl Frank, Karl Moldan and Sepp Schintelmeister) who effected the first ascent of this peak on August 7th. The latter party made several ascents in indifferent weather, during which a large number of bivouacs were necessary. Mt. Lyaler was climbed by the northeast ridge and an ascent made of Gestola with a traverse to Tetnuld during which a bivouac was utilized; the descent was made on the west side. Katuin Tau was ascended in two days of bad weather, as well as the Adish Tau in a continued high wind. The trip was finished off by making the ascent of the Bezingi face of Shkara, and traversing that mountain, continuing the traverse over Janga, Katuin Tau, Gestola and Lyaler, a seven days' trip, six nights being spent in ice caves!

♣

Matterhorn: Despite the bad weather prevailing during the summer of 1931, or rather perhaps because of it, two outstanding climbs were effected on this peak, known far and wide for its distinctive form and its impression of inaccessibility. The tremendous north face was climbed in two days of supreme effort by the brothers Franz and Anton Schmid of Munich. That they were able to make the ascent without being annihilated by falling rocks is perhaps attributable to the great amount of snow on the face, which helped to cement the loose stones. They were, however, subjected to considerable bombardment, and it may fairly be considered an act of Providence that they were able to step out upon the summit at 2.00 P.M. on August 1st after a day and a half of continuous climbing. They spent the night roped to a

tiny ledge in the middle of the face, and after completing the climb were stormbound at the Solvay Hut for several days.

Later in the year, October 15th, an Italian party composed of Sig. E. Benedetti, with the guides Louis Carrel and Maurice Bich effected the ascent of the south face under considerable difficulty and danger.

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In the spring of 1932 one of the two conquerors of the north face, Toni Schmid, was killed during a Whitsuntide excursion to the mountains. In an attempt to climb the northwest face of the Wiesbachhorn, on May 15th, he slipped while leading in the most difficult part of the ascent (an ice bastion with a slope of upwards of fifty degrees). His companion, Ernst Krebs, being unable to hold him, was pulled from his stance, both falling, still roped, about 1,600 feet. The accident was witnessed by another party which immediately went to their asssistance, finding Krebs badly injured, but Schmid dead, having apparently been instantly killed by skull fracture. One of the party stayed with Krebs, who was brought down the next day and is now reported to have entirely recovered.

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Dachl: One of the most difficult climbs and one of the most talked of rescues, of the past summer took place on the north face of the Dachl in the Gesäuse. Long known to Vienese as a rock-climbing goal, the direct route to the summit up the north face had been tried several times. It was finally accomplished last summer with the aid of a large amount of hardware in the shape of pitons and karabiner, in four days of continuous climbing. Many pitons were already in the rock, left by other defeated climbers (the last party to attempt the wall, in 1930, had to be rescued), so that a material saving was effected in the weight to be carried by the successful party. This climb was barely over, June 28th-July 1st, when another party attempting to emulate their feat, got into difficulties and had to be succored. A rescue party was obtained from Vienna, and, in all, eleven men spent several days and used two thousand feet of rope and innumerable pitons and karabiner in saving them.

♣

Lappland: On April 4th, 1931, the Lappland Alpine Club inaugurated at Nikkoluokta their first club hut, situated 100 miles within the Arctic Circle and forty miles from the nearest railroad. This is probably the most northern alpine hut in the world.

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Mt. Baker: It is reported, that a party of four climbers, Miss Milana Jank, Dr. Otto Strizek, and Messrs. Benjamin Thompson

and Robert Hayes accomplished the first ascent of Mt. Baker from the north on June 28th in twelve and a half hours.

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French Alpine Club: Our former president, Dr. William S. Ladd has recently been made an honorary member of the Club Alpin Français. Professor Piccard of stratosphere fame and F. S. Smythe, the conqueror of Kamet have been likewise honored.

♣

Mt. McKinley was climbed for the first time since 1913, early this summer when an expedition led by Alfred Lindley of Minneapolis and Harry K. Leik, Superintendent of Mt. McKinley National Park with Erling Strom of Lake Placid and Grant Pearson, a park ranger, succeeded in reaching both the north and south summits, the first party to ascend both peaks. On their return, they came upon traces of the accident which involved one of our members, an account of which appears elsewhere in these pages.

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Labrador: The Grenfell-Forbes expedition to northern Labrador led by Dr. Alexander Forbes in the summer of 1931 brought back considerable information on that country and reports a number of climbs in the Torngat and Kaumajet Ranges. In the Torngats, Noel E. Odell, Brewster Morris and Ernest Abbey ascended Tower Peak and another nearby. In August, Messrs. Odell, Abbey, and Hurlbut climbed a peak north of Ekortiafuk while Odell and Forbes ascended another unnamed peak north of Kangalaksiorvik, all being first ascents. In the Kaumajet Range, Odell, Morris, and Abbey climbed both summits of the Bishop's Mitre and another peak to the west of it, while Odell, Abbey and Harrison Kennard climbed yet another to the southeast.

♣

Accidents: The summer of 1931 was a most disastrous one for climbing. The terrible weather in the Alps caused a tremendous loss of life, while practically no great range was without its toll. In the Himalayas and the Caucasus and even in our own mountains, there were accidents fatal in results to climbers. Mt. Rainier has claimed another victim, although the whole affair may be attributed to bad mountaineering practice rather than to any danger inherent in the climb. The crumbly sandstone monoliths of Zion National Park have also claimed a victim, a solitary climber, whose fall may probably be explained by the deciduous nature of the handholds. An account of these accidents will be found in *Appalachia,* Vol. xviii No. 4 (Dec., 1931) pp. 471-72. Nevertheless, as time goes on, the tragic losses of mountaineering appear to be getting relatively insignificant.

Last season, the press reported over two score deaths in football and twenty killed and one hundred and one wounded during the hunting season in New York State alone.

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Andes: The first mountaineering hut in the Andes was opened at Easter of this year with due formality by the Deutsche Ausflug Vereine of Santiago and Valpariso. The hut, called "Lo Valdes," the construction of which was made possible by a subvention of RM. 5,000 from the Deutscher und Österreichischer Alpen Verein, is provided with a guardian and furnishes the first climbers' refuge in the central Andes of Chile, if not in all of South America.

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The Third International Congress of Alpinism will be held at Chamonix, August 25th to 28th to discuss numerous items under the six main headings of Mountaineering (general and technical), Science, Conservation, Travel and Transportation, Health, and Art, and to endeavor to arrive at a basis for international cooperation in these subjects. There will be unveiled a placque, similar to the Whymper placque at Zermatt, in memory of Doctor Paccard, who made the first ascent of Mont Blanc in company with Jacques Balmat. The design is by the eminent French sculptor, Paul Silvestre, under the direction of Mr. Montagnier. This memorial has been instigated through the French Alpine Club by some of its American members, and has been underwritten by them to the extent of $300. A substantial contribution has been promised by the A. C. The names of the French, American and English clubs will appear on the memorial. Members desiring to subscribe may send their checks to Dr. J. Monroe Thorington, 2031 Chestnut St., Philadelphia.

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Gesellschaft Alpiner Bücherfreunde. This organization, with headquarters in Munich, Theresienstrasse 78, was organized in 1928 for the purpose of producing German versions of rare and modern Alpine books for its members. The annual dues are RM. 10, plus RM. 1.60 for postage and shipping, this being the total amount that one pays in a given year for the books issued. With such men as Willi R. Rickmers and Walter Schmidkunz on the directing staff, this society is worthy of every encouragement and deserves the attention of all American climbers.

The following books have been issued to date:

Saussure's älteste Schrift überseine Montblanc-Besteigung. A facsimile of his *Relation d'un voyage à la cime du Montblanc,* together with the first German translation: *Kurzer Bericht über die Reise auf die Spitze des Montblanc.*

Max Rohrer: Berglieder der Völker. A volume of 300 pages, containing an extraordinary collection of poems and songs relating

to mountains, from Chinese, Japanese, Indian, Malayan, Greek, Roman and other sources.

Pater Corbinian Steinberger: Leben und Schriften. The story of a remarkable solo climber, the legendary first conqueror of the Königspitze.

Eugène Rambert: Das Murmeltier mit dem Halsband. The diary of a philosopher, translated from the French. The humorous and delightfully illustrated romance of the marmot.

Willi Rickmer Rickmers: Querschnitt durch mich. A cross-sectional autobiography of a man who has had amazing experiences and who writes of them in fascinating style.

Josias Simler: Die Alpen. The first German translation of the *De Alpibus commentarius,* illustrated and annotated in scholarly manner.

Walter Schmidkunz: Der Berg des Herzens. The battle with the "Monte Cuore," a romantic and thrilling story.

Otto Knorr: Der Grossvenediger in der Geschichte des Alpinismus. A noteworthy history of this white peak of the Tauern groups, from which one *cannot* see Venice.

Henry Hoek: Der denkende Wanderer. A book of charming recollections by a pioneer in the art of Alpine skiing.

The two books last mentioned have appeared in 1932. Projected for this year, in addition, are:

Karl Schuster: Weisse Berge, schwarze Zelte. Original adventures of a young guide and artist of Berchtesgaden.

Hermann Bühler: Alpine Bibliographie. The first volume of a complete international title list.

For the future, the following titles have been selected:

Charles Gos: Die Nacht an der Dru.
Des Bergführers Hans Kehrer Aufzeichnungen.
Der Bergsteiger Hans Pfann.
Leslie Stephen: Der Tummelplatz Europas.
Domenico Rudatis: Der Alpine Sport.
Carl Egger und Rudolf Singer: Die Eroberung des Kaukasus.

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A new low pass in the Canadian Rockies (4,250 feet) is reported by Prentiss N. Gray in *The Geographical Journal* for August, 1932 with a good map. It crosses the continental divide about seven miles to the northwest of Mt. Ida in the Jarvis Pass district and connects the Narraway branch of the Wapiti with the northeast fork of the McGregor (Fraser drainage). It lies approximately in longitude 120° 30′. (See map *A. A. J.,* 1930, p. 118.) The party reports the route as favorable for a railway from Beverlodge, Alberta, to Dome Creek on the Canadian National R. R. New elevations are given for Mt. Ida (10,135 feet) and Sir Alexander (10,980 feet).